

Final Third Quarter 2014 - Quarterly Groundwater Monitoring Report Inside Tunnel Wells

**Red Hill Bulk Fuel Storage Facility
Joint Base Pearl Harbor-Hickam, Oahu, Hawaii**

DOH Facility ID: 9-102271

DOH Release ID: 990051, 010011, 020028, and 140010

September 2014

**Department of the Navy
Naval Facilities Engineering Command, Hawaii
400 Marshall Road
JBPHH HI 96860-3139**



Contract Number N62742-12-D-1853, CTO 0002

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Prepared for:



**Department of the Navy
Naval Facilities Engineering Command, Hawaii
400 Marshall Road
JBPHH, HI 96860-3139**

Prepared by:

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Kailua, HI 96734**

Prepared under:

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FINAL
THIRD QUARTER 2014 - QUARTERLY GROUNDWATER MONITORING REPORT
INSIDE TUNNEL WELLS
RED HILL BULK FUEL STORAGE FACILITY

Long-Term Groundwater and Soil Vapor Monitoring
Red Hill Bulk Fuel Storage Facility
Joint-Base Pearl Harbor-Hickam, Oahu, Hawaii

Prepared for:
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Contract Number: N62742-12-D-1853
Contract Task Order: 0002

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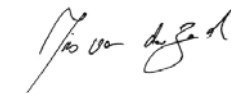


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9/19/2014

Date

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9/19/2014

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ACRONYMS AND ABBREVIATIONS

ACRONYMS/ ABBREVIATIONS	DEFINITION/MEANING
%	percent
bgs	below ground surface
COPC	Contaminant of Potential Concern
DLNR	State of Hawaii Department of Land and Natural Resources
DOH	State of Hawaii Department of Health
DON	Department of the Navy
EAL	Environmental Action Level
EPA	Environmental Protection Agency
ESI	Environmental Science International
F-76	Marine Diesel Fuel
ID	Identification
JBPHH	Joint Base Pearl Harbor-Hickam
JP-5	Jet Fuel Propellant-5
JP-8	Jet Fuel Propellant-8
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection
LOQ	Limit of Quantitation
µg/L	micrograms per liter
MS	Matrix Spike
MSD	Matrix Spike Duplicate
NAVFAC	Naval Facilities Engineering Command
NAVSUP FLC	Naval Supply Systems Command Fleet Logistics Center
PAH	Polycyclic Aromatic Hydrocarbons
PARCCS	Precision, Accuracy, Representativeness, Completeness, Comparability, and Sensitivity
pH	hydrogen activity
RHSF	Red Hill Bulk Fuel Storage Facility
RPD	Relative Percent Difference
SAP	Sampling and Analysis Plan
SSRBL	Site-Specific Risk-Based Level
TEC	The Environmental Company, Inc.
TPH-d	Total Petroleum Hydrocarbons as diesel
TPH-g	Total Petroleum Hydrocarbons as gasoline
U.S.	United States of America
UST	Underground Storage Tank
VOC	Volatile Organic Compound
WP	Work Plan

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EXECUTIVE SUMMARY

This quarterly groundwater monitoring report presents the results of the third quarter 2014 groundwater sampling conducted on July 21 and 22, 2014, at the Red Hill Bulk Fuel Storage Facility [RHSF], Joint Base Pearl Harbor-Hickam [JBPHH], Hawaii. The RHSF is located in Halawa Heights on the Island of Oahu. There are 18 active and 2 inactive Underground Storage Tanks [USTs] located at the RHSF. The State of Hawaii Department of Health [DOH] Facility Identification [ID] number is 9-102271. The DOH Release ID numbers are 990051, 010011, 020028, and 140010.

The groundwater sampling was conducted as part of the long-term groundwater and soil vapor monitoring at the RHSF and concurrent with release response activities initiated at Tank 5 in January, under Naval Facilities Engineering Command [NAVFAC] Contract Number N62742-12-D-1853. The sampling was conducted in accordance with the approved 2012 Work Plan [WP]/Sampling and Analysis Plan [SAP] prepared by Environmental Science International, Inc. [ESI].

On July 21 and 22, 2014, ESI personnel collected groundwater samples from four monitoring wells at the RHSF (wells RHMW01, RHMW02, RHMW03, and RHMW05) and one sampling point at Red Hill Shaft (RHMW2254-01). A primary and duplicate sample were collected from well RHMW02. A summary of the analytical results is provided below.

- **RHMW01** – Total Petroleum Hydrocarbons as diesel fuel [TPH-d] (67 micrograms per liter [$\mu\text{g/L}$]) was the only analyte detected. The TPH-d concentration detected did not exceed the DOH Environmental Action Levels [EALs] or the site-specific risk-based level [SSRBL]. TPH-d concentrations in this well have shown an overall decreasing trend from a high of 1,500 $\mu\text{g/L}$ in February 2005.
- **RHMW02** – TPH-d (1,200 and 1,300 $\mu\text{g/L}$), Total Petroleum Hydrocarbons as gasoline [TPH-g] (48 and 49 $\mu\text{g/L}$), xylenes (0.36 and 0.33 $\mu\text{g/L}$), acenaphthene (0.52 and 0.50 $\mu\text{g/L}$), fluorene (0.24 and 0.23 $\mu\text{g/L}$), 1-methylnaphthalene (25 and 26 $\mu\text{g/L}$), 2-methylnaphthalene (20 and 22 $\mu\text{g/L}$), and naphthalene (71 and 76 $\mu\text{g/L}$) were detected. TPH-d was detected at concentrations above the DOH EALs for both drinking water toxicity and gross contamination, but below half the SSRBL. The polycyclic aromatic hydrocarbons [PAHs] 1-methylnaphthalene and naphthalene were detected at concentrations above the DOH EALs for both drinking water toxicity and gross contamination. 2-Methylnaphthalene was detected at concentrations above the DOH EAL for gross contamination. TPH-d concentrations have generally been decreasing in this well since January 15, 2014; however, the concentrations of 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene increased to their highest levels since January 2013.
- **RHMW03** – TPH-d (37 $\mu\text{g/L}$) was the only analyte detected. None of the chemical constituents analyzed for were detected at concentrations above the DOH EALs.

- **RHMW05** – None of the chemical constituents analyzed for were detected.
- **RHMW2254-01** – None of the chemical constituents analyzed for were detected.

Between January and July 2014, the sampling frequency of the wells and monitoring point inside Red Hill increased, due to response activities related to a reported release at Tank 5. Since the previous quarterly sampling event in April 2014, three wells (RHMW01, RHMW02, and RHMW05) and one sampling point (RHMW2254-01) have each been sampled three times, including this quarterly event. During this period only TPH-d in RHMW01 and TPH-d, 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene in RHMW02 were detected at concentrations exceeding the DOH EALs. However, the TPH-d concentration detected in RHMW01 only exceeded the DOH EAL during the April 7, 2014 release response groundwater monitoring event. TPH-d concentrations were less than half the SSRBL. Groundwater contaminant concentrations for this period in the other three wells (RHMW03, RHMW05, and RHMW2254-01) remained at low concentrations and did not change significantly, or were not detected.

Concentrations of 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene in RHMW02 show an increasing trend since March 5, 2014, but remain below the historic maximums detected in the well. All other analytical results were generally consistent with historical data.

Based on the groundwater monitoring results and the reported release at Tank 5 in January 2014, continued groundwater monitoring at the wells inside the RHSF tunnel is recommended. The next quarterly event is tentatively scheduled for October 2014.

SECTION 1 – INTRODUCTION

This quarterly groundwater monitoring report presents the results of the third quarter 2014 groundwater sampling conducted on July 21 and 22, 2014, at the RHSF, JBPHH. The RHSF is located in Halawa Heights on the Island of Oahu. The purpose of the sampling is to (1) assess the condition of groundwater beneath the RHSF with respect to chemical constituents associated with jet fuel propellant and marine diesel fuel, and (2) to ensure the Navy remains in compliance with DOH UST release response requirements as described in Hawaii Administrative Rules Chapter 11-281 Subchapter 7, *Release Response Action* (DOH, 2013). The DOH Facility ID number for the RHSF is 9-102271. The DOH Release ID numbers are 990051, 010011, 020028, and 140010.

The groundwater sampling was conducted as part of the long-term groundwater and soil vapor monitoring at the RHSF, under NAVFAC Contract Number N62742-12-D-1853. The sampling was conducted in accordance with the approved WP/SAP prepared by ESI (ESI, 2012).

1.1 SITE DESCRIPTION

The RHSF is located on federal government land (zoned F1- Military and Federal), located in Halawa Heights, approximately 2.5 miles northeast of Pearl Harbor (Figure 1). It is located on a low ridge on the western edge of the Koolau Mountain Range that divides Halawa Valley from Moanalua Valley. The RHSF is bordered on the north by Halawa Correctional Facility and private businesses, on the west by the United States of America [U.S.] Coast Guard reservation, on the south by residential neighborhoods, and on the east by Moanalua Valley. A quarry is located less than a quarter mile away to the northwest. The RHSF occupies 144 acres of land and the majority of the site is at an elevation of approximately 200 to 500 feet above mean sea level.

The RHSF contains 18 active and 2 inactive USTs that are operated by Naval Supply Systems Command Fleet Logistics Center [NAVSUP FLC] Pearl Harbor (formerly Fleet and Industrial Supply Center). Each UST has a capacity of approximately 12.5 million gallons. The RHSF is located approximately 100 feet above the basal aquifer. The USTs contain Jet Fuel Propellant-5 [JP-5], Jet Fuel Propellant-8 [JP-8], and Marine Diesel Fuel [F-76]. The current status of the USTs are summarized in Table 1.1.

Four groundwater monitoring wells (wells RHMW01, RHMW02, RHMW03, and RHMW05) and one sampling point at Red Hill Shaft (RHMW2254-01) are located within the RHSF lower access tunnel (Figure 2). Three groundwater monitoring wells (wells HDMW2253-03, OWDFMW01, and RHMW04) are located outside of the RHSF tunnel system. Monitoring data for the three wells located outside the tunnel are included in a separate report.

As noted, monitoring wells RHMW01, RHMW02, RHMW03, and RHMW05 are located inside the underground tunnels. Sampling point RHMW2254-01 is located inside the infiltration gallery of the Department of the Navy [DON] drinking water supply Well 2254-01. The DON Well

2254-01 is located approximately 2,400 feet downgradient of the USTs and provides potable water to the JBPHH Water System, which serves approximately 65,200 military customers. NAVFAC Public Works Department operates the infiltration gallery and DON Well 2254-01.

TABLE 1.1
Current Status of the USTs
Red Hill Bulk Fuel Storage Facility
July 2014 Quarterly Monitoring Report

Tank Identification	Fuel Type	Status	Capacity
F-1	None	Inactive	12.5 million gallons
F-2	JP-8	Active	12.5 million gallons
F-3	JP-8	Active	12.5 million gallons
F-4	JP-8	Active	12.5 million gallons
F-5	JP-8	Active	12.5 million gallons
F-6	JP-8	Active	12.5 million gallons
F-7	JP-5	Active	12.5 million gallons
F-8	JP-5	Active	12.5 million gallons
F-9	JP-5	Active	12.5 million gallons
F-10	JP-5	Active	12.5 million gallons
F-11	JP-5	Active	12.5 million gallons
F-12	JP-5	Active	12.5 million gallons
F-13	F-76	Active	12.5 million gallons
F-14	F-76	Active	12.5 million gallons
F-15	F-76	Active	12.5 million gallons
F-16	F-76	Active	12.5 million gallons
F-17	JP-5	Active	12.5 million gallons
F-18	JP-5	Active	12.5 million gallons
F-19	None	Inactive	12.5 million gallons
F-20	JP-5	Active	12.5 million gallons

F-76 Marine Diesel Fuel

JP-5 Jet Fuel Propellant-5

JP-8 Jet Fuel Propellant-8

1.2 PHYSICAL SETTING

Climatological conditions in the area of the RHSF consist of warm to moderate temperatures and low to moderate rainfall. The RHSF is leeward of the prevailing northeasterly trade winds. The average annual precipitation is approximately 40 inches, which occurs mainly between November and April (State of Hawaii Department of Land and Natural Resources [DLNR], 1986). Annual pan evaporation is approximately 75 inches (DLNR, 1985). Average temperatures range from the low 60's to high 80's (degrees Fahrenheit) (Atlas of Hawaii, 1983).

Oahu consists of the eroded remnants of two shield volcanoes, Waianae and Koolau. The RHSF is located on the southwest flank of the Koolau volcanic shield. Lavas erupted during the shield-building phase of the volcano belong to the *Koolau Volcanic Series* (Stearns and Vaksvik, 1935). Following formation of the Koolau shield, a long period of volcanic quiescence occurred, during which the shield was deeply eroded. Following this erosional period, eruptive activity resumed. Lavas and pyroclastic material erupted during this period belong to the *Honolulu Volcanic Series* (Stearns and Vaksvik, 1935).

In the immediate area of the RHSF, Koolau Volcanic Series lavas dominate, although there are consolidated and unconsolidated non-calcareous deposits in the vicinity that consist of alluvium generated during erosion of the Koolau volcanic shield. South-southwest of the RHSF, and in isolated exposures to the west, are pyroclastic deposits formed during eruptions from three Honolulu Volcanic Series vents, Salt Lake, Aliamanu, and Makalapa (Stearns and Vaksvik, 1935). Based on established geology and records of the drilled wells (Stearns and Vaksvik, 1938), the RHSF is underlain by Koolau Volcanic Series basalts. The area of the RHSF is classified as *Rock Land*, where 25-90% of the land surface is covered by exposed rock and there are only shallow soils (Foote, et al., 1972).

Groundwater in Hawaii exists in two principal types of aquifers. The first and most important type, in terms of drinking water resources, is the basal aquifer. The basal aquifer exists as a lens of fresh water floating on and displacing seawater within the pore spaces, fractures, and voids of the basalt that forms the underlying mass of each Hawaiian island. In parts of Oahu, groundwater in the basal aquifer is confined by the overlying caprock and is under pressure. Waters that flow freely to the surface from wells that tap the basal aquifer are referred to as *artesian*.

The second type of aquifer is the caprock aquifer, which consists of various kinds of unconfined and semi-confined groundwater. Commonly, the caprock consists of a thick sequence of nearly impermeable clays, coral, and basalt, which separates the caprock aquifer from the basal aquifer. The impermeable nature of these materials and the artesian nature of the basal aquifer severely restrict the downward migration of groundwater from the upper caprock aquifer. In the area of the RHSF, there is no discernible caprock.

Groundwater in the area of the RHSF is part of the *Waimalu Aquifer System* of the *Pearl Harbor Aquifer Sector*. The aquifer is classified as a basal, unconfined, flank-type; and is currently used as a drinking water source. The aquifer is considered fresh with less than 250 milligrams per liter of chloride and is considered an irreplaceable resource with a high vulnerability to contamination (Mink and Lau, 1990).

The nearest drinking water supply well is DON Well 2254-01, located in the infiltration gallery within the RHSF lower tunnel. The DON Well 2254-01 is located approximately 2,400 feet hydraulically and topographically downgradient of the USTs (Figure 2).

1.3 BACKGROUND

The RHSF was constructed by the U.S. Government in the early 1940s. Twenty USTs and a series of tunnels were constructed. The USTs were constructed of steel, and in the past have stored DON special fuel oil, DON distillate, aviation gasoline, and motor gasoline (Environet, 2010). The tanks currently contain JP-5, JP-8, and F-76. The fueling system is a self-contained underground unit that was installed into native rock comprised primarily of basalt with some interbedded tuffs and breccias (Environet, 2010). Each UST measures approximately 250 feet

in height and 100 feet in diameter. The upper domes of the tanks lie at a depth varying between 100 feet and 200 feet below ground surface [bgs].

In 1998, Earth Tech conducted a Phase II Remedial Investigation/Feasibility Study for the Oily Waste Disposal Facility located within the RHSF. The study included the installation of well OWDFMW01 (which was originally MW08) (Earth Tech, 1999).

In February 2001, the DON installed groundwater monitoring well RHMW01 to monitor for contamination in the basal aquifer beneath the RHSF. Well RHMW01 was installed approximately 100 feet below grade within the lower access tunnel. The depth to water was measured at 86 feet below the tunnel floor at the time of the well completion. In February 2001, a groundwater sample was collected from the well. Total Petroleum Hydrocarbons [TPH] and total lead were detected in the sample. Total lead was detected at a concentration above the DOH Tier 1 groundwater action level of 5.6 µg/L (The Environmental Company, Inc. [TEC], 2009; DOH, 2000).

In 2005, the RHSF groundwater monitoring program was initiated. It involved routine groundwater sampling of well RHMW01 and sampling point RHMW2254-01. Samples were collected in February, June, September, and December of 2005. Lead was detected at concentrations above the DOH Tier 1 action level of 5.6 µg/L in samples collected in February and June. The samples collected in February and June were not filtered prior to analysis, whereas the samples collected in September and December were filtered prior to analysis. Since the samples collected in February and June were not filtered prior to analysis, the lead results were not considered appropriate for a risk assessment (TEC, 2008).

Between June and September 2005, TEC installed three additional groundwater monitoring wells (wells RHMW02, RHMW03, and RHMW04) (TEC, 2008). Well RHMW04 was installed hydraulically upgradient of the USTs to provide background geochemistry information for water moving through the basal aquifer beneath the RHSF. Wells RHMW02 and RHMW03 were installed approximately 125 feet below grade within the RHSF lower tunnel and well RHMW04 was installed to a depth of approximately 300 feet bgs outside of the RHSF tunnels. In September 2005, groundwater samples were collected from the three newly installed groundwater monitoring wells (wells RHMW02, RHMW03, and RHMW04) along with the existing well RHMW01 and sampling point RHMW2254-01. The contaminants of potential concern [COPCs] with concentrations exceeding current DOH EALs are summarized below.

- **RHMW01** – TPH-d was detected at concentrations above the DOH EAL.
- **RHMW02** – TPH-g, TPH-d, naphthalene, trichloroethylene, 1-methylnaphthalene, and 2-methylnaphthalene were detected at concentrations above the DOH EALs.
- **RHMW03** – TPH-d was detected at concentrations above the DOH EAL.

In 2006, TEC installed dedicated sampling pumps in the four wells (wells RHWM01, RHWM02, RHMW03, and RHWM04) and one sampling point (RHMW2254-01). In July and December of

2006, groundwater samples were collected from the four wells and the sampling point. The COPCs with concentrations exceeding current DOH EALs are summarized below.

- **RHWM01** – TPH-d and naphthalene were detected at concentrations above the DOH EALs.
- **RHWM02** – TPH-g, TPH-d, and naphthalene were detected at concentrations above the DOH EALs.
- **RHWM03** – TPH-d was detected at concentrations above the DOH EAL.

In 2007, SSRBLs were established for TPH (4,500 µg/L) and benzene (750 µg/L) (TEC, 2007). Groundwater samples were collected from wells RHWM01, RHWM02, and RHWM03, and sampling point RHMW2254-01. Samples were collected in March, June, and September of 2007. The COPCs with concentrations exceeding current DOH EALs are summarized below.

- **RHWM01** – TPH-d was detected at concentrations above the DOH EAL, but below the SSRBL.
- **RHWM02** – TPH-g, TPH-d, naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene were detected at concentrations above the DOH EALs. The TPH-d concentrations were below the SSRBL.
- **RHWM03** – TPH-d was detected at concentrations above the DOH EAL, but below the SSRBL.

In 2008, groundwater samples were collected from wells RHWM01, RHWM02, and RHWM03, and sampling point RHMW2254-01. Samples were collected in January, April, July, and October of 2008. The COPCs with concentrations exceeding current DOH EALs are summarized below. In addition, a groundwater protection plan (TEC, 2008) was prepared.

- **RHWM01** – TPH-d was detected at concentrations above the DOH EAL, but below the SSRBL.
- **RHWM02** – TPH-d, naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene were detected at concentrations above the DOH EALs. The TPH-d concentrations detected in October 2008 were also above the SSRBL.
- **RHWM03** – TPH-d was detected at concentrations above the DOH EAL, but below the SSRBL.

In April 2009, groundwater monitoring well RHMW05 was installed downgradient of the USTs, within the lower access tunnel between RHWM01 and RHMW2254-01. It was installed to identify the extent of contamination hydraulically downgradient of the USTs. Well RHMW05 was added to the quarterly groundwater sampling program. In 2009, quarterly groundwater samples were collected from wells RHWM01, RHWM02, RHWM03, and RHMW05, and sampling point RHMW2254-01. Samples were collected in February, May, July, and October of 2009. The COPCs with concentrations exceeding current DOH EALs are summarized below. In addition, the Groundwater Protection Plan was revised.

- **RHWMW01** – TPH-d and 1-methylnaphthalene were detected at concentrations above the DOH EALs. The TPH-d concentrations were below the SSRBL.
- **RHWMW02** – TPH-d, naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene were detected at concentrations above the DOH EALs. The TPH-d concentrations were below the SSRBL.
- **RHWMW03** – TPH-d was detected at a concentration above the DOH EAL, but below the SSRBL.
- **RHWMW05** – TPH-d was detected at a concentration above the DOH EAL, but below the SSRBL.

In 2010, groundwater samples were collected from wells RHWM01, RHWM02, RHWMW03, and RHWMW05, and sampling point RHMW2254-01. Samples were collected in January, April, July, and October. The COPCs with concentrations exceeding current DOH EALs are summarized below.

- **RHWMW01** – TPH-d was detected at concentrations above the DOH EAL, but below the SSRBL.
- **RHWMW02** – TPH-g, TPH-d, naphthalene, and 1-methylnaphthalene were detected at concentrations above the DOH EALs. The TPH-d concentrations were below the SSRBL.
- **RHWMW03** – TPH-d was detected at a concentration above the DOH EAL, but below the SSRBL.
- **RHWMW05** – TPH-d was detected at a concentration above the DOH EAL, but below the SSRBL.

In 2011, quarterly groundwater samples were collected from wells RHWM01, RHWM02, RHWMW03, and RHMW05, and sampling point RHMW2254-01. Samples were collected in January, April, July, and October. In a Fall 2011 update, the DOH EALs were revised. The drinking water toxicity EAL for TPH-d decreased from 210 to 190 µg/L (DOH, 2011). The COPCs with concentrations exceeding current DOH EALs are summarized below.

- **RHWMW01** – TPH-d was detected at concentrations above the DOH EAL, but below the SSRBL.
- **RHWMW02** – TPH-d, naphthalene, indeno[1,2,3-cd]pyrene, and 1-methylnaphthalene were detected at concentrations above the DOH EALs. The TPH-d concentrations were below the SSRBL.

In 2012, quarterly groundwater samples were collected from wells RHWM01, RHWM02, RHWMW03, and RHMW05, and sampling point RHMW2254-01. Samples were collected in February, April, July, and November. The COPCs with concentrations exceeding current DOH EALs are summarized below.

- **RHWMW01** – TPH-d was detected at concentrations above the DOH EAL, but below the SSRBL.

- **RHMW02** – TPH-d, TPH-g, naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene were detected at concentrations above the DOH EALs. The TPH-d concentrations were below the SSRBL.

In 2013, quarterly groundwater samples were collected from wells RHMW01, RHMW02, RHMW03, and RHMW05, and sampling point RHMW2254-01. Samples were collected in January, April, July, and October. The COPCs with concentrations exceeding current DOH EALs are summarized below.

- **RHMW01** – TPH-d was detected at concentrations above the DOH EAL, but below the SSRBL.
- **RHMW02** – TPH-d, TPH-g, naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene were detected at concentrations above the DOH EALs. The TPH-d concentrations were below the SSRBL.

In January 2014, quarterly groundwater samples were collected from wells RHMW01, RHMW02, RHMW03, RHMW05, and sampling point RHMW2254-01. The COPCs with concentrations exceeding current DOH EALs are summarized below.

- **RHMW01** – TPH-d was detected at a concentration above the DOH EAL, but below the SSRBL.
- **RHMW02** – TPH-d, naphthalene, and 1-methylnaphthalene were detected at concentrations above the DOH EALs. The TPH-d concentrations exceeded the SSRBL.

Between January and April 2014, additional groundwater sampling was conducted at wells RHMW01, RHMW02, RHMW05, and sampling point RHMW2254-01 in response to a suspected release from Tank 5. The COPCs with concentrations exceeding current DOH EALs are summarized below.

- **RHMW01** – TPH-d was detected at concentrations above the DOH EAL, but below the SSRBL.
- **RHMW02** – TPH-d, naphthalene, and 1-methylnaphthalene were detected at concentrations above the DOH EALs. The TPH-d concentrations were below the SSRBL.

In April 2014, quarterly groundwater samples were collected from wells RHMW01, RHMW02, RHMW03, RHMW05, and sampling point RHMW2254-01. The COPCs with concentrations exceeding current DOH EALs are summarized below.

- **RHMW02** – TPH-d and naphthalene were detected at concentrations above both DOH EALs. 1-Methylnaphthalene was detected at concentrations above the DOH EAL for drinking water toxicity. The TPH-d concentrations were below the SSRBL.

In May and June 2014, additional groundwater sampling was conducted at wells RHMW01, RHMW02, RHMW05, and sampling point RHMW2254-01 in response to a reported release

from Tank 5. The COPCs with concentrations exceeding current DOH EALs are summarized below.

- **RHMW02** – TPH-d, naphthalene, and 1-methylnaphthalene were detected at concentrations above the DOH EALs. The TPH-d concentrations were below the SSRBL.

1.3.1 Previous Reports

The following groundwater monitoring reports were previously submitted to the DOH:

1. Groundwater Sampling Report, First Quarter 2005 (submitted April 2005).
2. Groundwater Sampling Report, Second Quarter 2005 (submitted August 2005).
3. Groundwater Sampling Report, Third Quarter 2005 (submitted November 2005).
4. Groundwater Sampling Report, Fourth Quarter 2005 (submitted February 2006).
5. Groundwater Monitoring Results, July 2006 (submitted September 2006).
6. Groundwater Monitoring Results, December 2006 (submitted January 2007).
7. Groundwater Monitoring Results, March 2007 (submitted May 2007).
8. Groundwater Monitoring Results, June 2007 (submitted August 2007).
9. Groundwater Monitoring Results, September 2007 (submitted October 2007).
10. Groundwater Monitoring Report, January 2008 (submitted March 2008).
11. Groundwater Monitoring Report, April 2008 (submitted May 2008).
12. Groundwater Monitoring Report, July 2008 (submitted October 2008).
13. Groundwater Monitoring Report, October and December 2008 (submitted February 2009).
14. Groundwater Monitoring Report, February 2009 (submitted May 2009).
15. Groundwater Monitoring Report, May 2009 (submitted July 2009).
16. Groundwater Monitoring Report, July 2009 (submitted September 2009).
17. Groundwater Monitoring Report, October 2009 (submitted December 2009).
18. Groundwater Monitoring Report, January, February, and March 2010 (submitted April 2010).
19. Groundwater Monitoring Report, April 2010 (submitted May 2010).

20. Groundwater Monitoring Report, July 2010 (submitted August 2010).
21. Groundwater Monitoring Report, October 2010 (submitted December 2010).
22. Groundwater Monitoring Report, January 2011 (submitted March 2011).
23. Groundwater Monitoring Report, April 2011 (submitted June 2011).
24. Groundwater Monitoring Report, July 2011 (submitted September 2011).
25. Groundwater Monitoring Report, October 2011 (submitted December 2011).
26. Groundwater Monitoring Report, January-February 2012 (submitted March 2012).
27. Groundwater Monitoring Report, April 2012 (Submitted July 2012).
28. Groundwater Monitoring Report, October 2012 (Submitted January 2013).
29. Groundwater Monitoring Report, January 2013 (Submitted April 2013).
30. Groundwater Monitoring Report, April 2013 (Submitted July 2013).
31. Groundwater Monitoring Report, July 2013 (Submitted September 2013).
32. Groundwater Monitoring Report, October 2013 (Submitted January 2014).
33. Groundwater Sampling Report for Additional Sampling, January 2014 (submitted January 2014).
34. Groundwater Monitoring Report, January 2014 (Submitted April 2014).
35. Groundwater Sampling Report for Tank 5 Release Response on March 5 and 6, 2014 (submitted March 2014).
36. Groundwater Sampling Report for Tank 5 Release Response on March 10, 2014 (submitted March 2014).
37. Groundwater Sampling Report for Tank 5 Release Response on March 25 and 26, 2014 (submitted April 2014).
38. Groundwater Sampling Report for Tank 5 Release Response on April 7, 2014 (submitted April 2014).
39. Groundwater Monitoring Report, April 2014 (Submitted June 2014).
40. Groundwater Sampling Report for Tank 5 Release Response on May 27 and 28, 2014 (submitted June 2014).

41. Groundwater Sampling Report for Tank 5 Release Response on June 23 and 24, 2014
(submitted July 2014).

SECTION 2 – GROUNDWATER SAMPLING

On July 21 and 22, 2014, ESI personnel collected groundwater samples from four monitoring wells at the RHSF (wells RHMW01, RHMW02, RHMW03, and RHMW05) and one sampling point at Red Hill Shaft (RHMW2254-01). The samples were collected in accordance with the 2012 WP/SAP. The WP/SAP is consistent with DOH UST release response requirements (DOH, 2000); DoN Procedure I-C-3, *Monitoring Well Sampling* (DoN, 2007); and the RHSF Groundwater Protection Plan (TEC, 2008). Prior to purging and sampling, the depth to groundwater and the depth to the bottoms of the wells were measured using a Geotech oil/water interface probe. No measurable product, sheen, or petroleum hydrocarbon odor was detected in any of the wells with the exception of RHMW02. A moderate petroleum hydrocarbon odor was noticed when collecting groundwater samples from RHMW02.

2.1 GROUNDWATER SAMPLING

Prior to collecting groundwater samples, the monitoring wells were purged of standing water in the well casings. Each well contains a dedicated bladder pump which was used to purge the well and to collect samples. To operate the pump, a portable air compressor with an in-line filter was connected to a QED MP50 MicroPurge® Basics Controller box, which was then connected to the pump. The compressor was turned on to power the pump and the controller was used to adjust the pumping rate to less than one liter of water per minute.

Water quality parameters were monitored on a periodic basis during well purging. The water quality parameters that were measured included hydrogen activity [pH], temperature, conductivity, dissolved oxygen, and oxidation reduction potential. The water quality parameters were evaluated to assess whether the natural characteristics of the aquifer formation water were present within the monitoring wells before collecting the samples. At least four readings were collected during the purging process. Purging was considered complete when at least three consecutive water quality measurements stabilized within approximately 10%. The readings were recorded on groundwater monitoring logs. The groundwater monitoring logs are included in Appendix A. In addition, field notes were taken to document the sampling event. The field notes are included in Appendix B.

When the water quality parameters stabilized, groundwater samples were collected from the wells using the bladder pumps. The groundwater samples were collected no more than two hours after purging was completed to decrease groundwater interaction with the monitoring well casing and atmosphere. Prior to collecting the sample, the water level in the monitoring wells was measured and recorded to ensure that excessive drawn down had not occurred. The groundwater samples were collected at flow rates of approximately 0.17 to 0.5 liters per minute. Samples collected for dissolved lead analysis were filtered in the field using new 0.45 micron filters.

2.2 ANALYTICAL RESULTS

The samples were analyzed for TPH-d using U.S. Environmental Protection Agency [EPA] Method 8015M, TPH-g and Volatile Organic Compounds [VOCs] using EPA Method 8260B, PAHs using EPA Method 8270C SIM, dissolved lead using EPA Method 6020, and total lead using EPA Method 200.8. The sample collected from sampling point RHMW2254-01 was analyzed for total lead (unfiltered) as DON Well 2254-01 is a drinking water supply well. The analytical results are described below and summarized in Table 2.1. A copy of the laboratory report is included in Appendix C. Analytical results were compared to the DOH EALs for drinking water toxicity and gross contamination and to the SSRBLs established in the RHSF Final Groundwater Protection Plan (TEC, 2008).

- **RHMW01** – TPH-d (67 µg/L) was the only analyte detected. The TPH-d concentration detected did not exceed the DOH EALs or the SSRBL.
- **RHMW02** – TPH-d (1,200 and 1,300 µg/L), TPH-g (48 and 49 µg/L), xylenes (0.36 and 0.33 µg/L), acenaphthene (0.52 and 0.50 µg/L), fluorene (0.24 and 0.23 µg/L), 1-methylnaphthalene (25 and 26 µg/L), 2-methylnaphthalene (20 and 22 µg/L), and naphthalene (71 and 76 µg/L) were detected. TPH-d, 1-methylnaphthalene, and naphthalene were detected at concentrations above their respective DOH EALs for both drinking water toxicity and gross contamination. However, the TPH-d concentrations did not exceed the SSRBL. 2-Methylnaphthalene was detected at concentrations above the DOH EAL for gross contamination.
- **RHMW03** – TPH-d (37 µg/L) was the only analyte detected. None of the chemical constituents analyzed for were detected at concentrations above the DOH EALs or the SSRBL.
- **RHMW05** – None of the chemical constituents analyzed for were detected.
- **RHMW2254-01** – None of the chemical constituents analyzed for were detected.

Acetone (6.5 µg/L) was detected in the trip blank submitted on July 21, 2014. Acetone was not detected in any of the groundwater samples, and this is not likely to affect data usability.

2.3 GROUNDWATER CONTAMINANT TRENDS

The historical groundwater contaminant concentration trends for COPCs that exceeded the DOH EALs or SSRBLs are illustrated in Appendix D. A summary of groundwater contaminant trends is provided below.

- **RHMW01** – COPCs detected during this round of quarterly sampling are consistent with the historical data for RHMW01. TPH-d has historically been detected at concentrations above the DOH EAL for both drinking water toxicity and gross contamination. TPH-d

concentrations have shown an overall decreasing trend from a high of 1,500 µg/L in February 2005. The TPH-d concentration was last above the DOH EAL for gross contamination in a sample collected on April 7, 2014.

- **RHMW02** – COPCs detected during this round of quarterly sampling are consistent with the historical data for RHMW02. TPH-g, TPH-d, trichloroethylene, 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene have historically been detected at concentrations above the DOH EALs. TPH-d concentrations increased sharply from 2,400 µg/L to 5,100 µg/L during the additional sampling event on January 15, 2014, exceeding the SSRBL of 4,500 µg/L. During this July 2014 event, TPH-d concentrations decreased to an average of 1,250 µg/L but remained above both DOH EALs. The concentrations of 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene increased to their highest levels since January 2013. The concentrations of TPH-g remained below the DOH EALs for gross contamination and drinking water toxicity. Trichloroethylene has not been detected in RHMW02 since September 2005.
- **RHMW03** – COPCs detected during this round of quarterly sampling are consistent with the historical data for RHMW03. TPH-d has historically been detected at concentrations above the DOH EALs; however, it has not been detected at concentrations above the DOH EALs since October 2010.
- **RHMW05** – No COPCs were detected during this round of quarterly sampling. TPH-d has historically been detected in RHMW05 at concentrations above the DOH EAL for both drinking water toxicity and gross contamination; however, it has not been detected at concentrations above the DOH EALs since January 2010.
- **RHMW2254-01** – No COPCs were detected during this round of quarterly sampling. TPH-d was last detected in RHMW2254-01 at a concentration above the DOH EAL for gross contamination in January 2008. Although the method reporting limits for TPH-d exceeded one or both DOH EALs between May 2009 and July 2010, TPH-d has not been detected at concentrations above the DOH EALs since January 2008.

Historical groundwater contaminant trends for concentrations above the DOH EALs for both drinking water toxicity and gross contamination are illustrated in Appendix D.

2.4 WASTE DISPOSAL

The purged groundwater and decontamination water generated during sampling of the inside tunnel wells were stored in a 55-gallon drum along with the purged water and decontamination water from the outside tunnel wells. The drum is currently stored onsite at ADIT 3 on top of a secondary containment spill pallet and covered by a tarp. There is a non-hazardous label affixed to the drum with all pertinent information relating to its generation. The drum will be used for future sampling events and will be properly disposed of once it has been filled.

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TABLE 2.1
Analytical Results for Groundwater Sampling (July 21 and 22, 2014)
Red Hill Bulk Fuel Storage Facility
July 2014 Quarterly Monitoring Report

Method	Chemical	DOH EALs		RHMW2254-01 (ES107)					RHMW01 (ES103)					RHMW02 (ES104)					RHMW03 (ES106)					RHMW05 (ES108)				
		Drinking Water Toxicity	Gross Contamination	Results	Q	LOQ	LOD	DL	Results	Q	LOQ	LOD	DL	Results	Q	LOQ	LOD	DL	Results	Q	LOQ	LOD	DL	Results	Q	LOQ	LOD	DL
EPA 8015B	TPH-d	190	100	N.D.	U	25	12	7.4	67	HD	25	10	7.4	1,200	HD	25	10	7.4	37	HD	25	10	7.4	N.D.	U	25	12	7.4
EPA 8260B	TPH-g	100	100	N.D.	U	50	30	26	N.D.	U	50	30	26	48	J	50	30	26	N.D.	U	50	30	26	N.D.	U	50	30	26
EPA 8270C	Acenaphthene	370	20	N.D.	U	0.2	0.048	0.020	N.D.	U	0.2	0.051	0.021	0.52		0.2	0.048	0.021	N.D.	U	0.2	0.047	0.020	N.D.	U	0.2	0.049	0.021
	Acenaphthylene	240	2,000	N.D.	U	0.2	0.048	0.018	N.D.	U	0.2	0.051	0.018	N.D.	U	0.2	0.048	0.018	N.D.	U	0.2	0.047	0.018	N.D.	U	0.2	0.049	0.018
	Anthracene	1,800	22	N.D.	U	0.2	0.048	0.034	N.D.	U	0.2	0.051	0.034	N.D.	U	0.2	0.048	0.035	N.D.	U	0.2	0.047	0.034	N.D.	U	0.2	0.049	0.035
	Benzo[a]anthracene	0.092	4.7	N.D.	U	0.2	0.048	0.023	N.D.	U	0.2	0.051	0.024	N.D.	U	0.2	0.048	0.024	N.D.	U	0.2	0.047	0.023	N.D.	U	0.2	0.049	0.024
	Benzo[g,h,i]perylene	1,500	0.13	N.D.	U	0.2	0.048	0.022	N.D.	U	0.2	0.051	0.022	N.D.	U	0.2	0.048	0.022	N.D.	U	0.2	0.047	0.022	N.D.	U	0.2	0.049	0.022
	Benzo[a]pyrene	0.2	0.81	N.D.	U	0.2	0.048	0.036	N.D.	U	0.2	0.051	0.037	N.D.	U	0.2	0.048	0.037	N.D.	U	0.2	0.047	0.036	N.D.	U	0.2	0.049	0.037
	Benzo[b]fluoranthene	0.092	0.75	N.D.	U	0.2	0.048	0.025	N.D.	U	0.2	0.051	0.025	N.D.	U	0.2	0.048	0.025	N.D.	U	0.2	0.047	0.025	N.D.	U	0.2	0.049	0.025
	Benzo[k]fluoranthene	0.92	0.4	N.D.	U	0.2	0.048	0.023	N.D.	U	0.2	0.051	0.024	N.D.	U	0.2	0.048	0.024	N.D.	U	0.2	0.047	0.023	N.D.	U	0.2	0.049	0.024
	Chrysene	9.2	1	N.D.	U	0.2	0.048	0.019	N.D.	U	0.2	0.051	0.019	N.D.	U	0.2	0.048	0.019	N.D.	U	0.2	0.047	0.019	N.D.	U	0.2	0.049	0.019
	Dibenzo[a,h]anthracene ¹	0.0092	0.52	N.D.	U	0.2	0.048	0.026	N.D.	U	0.2	0.051	0.027	N.D.	U	0.2	0.048	0.027	N.D.	U	0.2	0.047	0.026	N.D.	U	0.2	0.049	0.027
	Fluoranthene	1,500	130	N.D.	U	0.2	0.048	0.027	N.D.	U	0.2	0.051	0.027	N.D.	U	0.2	0.048	0.028	N.D.	U	0.2	0.047	0.027	N.D.	U	0.2	0.049	0.028
	Fluorene	240	950	N.D.	U	0.2	0.048	0.024	N.D.	U	0.2	0.051	0.025	0.24		0.2	0.048	0.025	N.D.	U	0.2	0.047	0.024	N.D.	U	0.2	0.049	0.025
	Indeno[1,2,3-cd]pyrene	0.092	0.095	N.D.	U	0.2	0.048	0.022	N.D.	U	0.2	0.051	0.022	N.D.	U	0.2	0.048	0.022	N.D.	U	0.2	0.047	0.022	N.D.	U	0.2	0.049	0.022
	1-Methylnaphthalene	4.7	10	N.D.	U	0.2	0.048	0.028	N.D.	U	0.2	0.051	0.029	25		0.2	0.96	0.029	N.D.	U	0.2	0.047	0.028	N.D.	U	0.2	0.049	0.029
	2-Methylnaphthalene	24	10	N.D.	U	0.2	0.048	0.026	N.D.	U	0.2	0.051	0.027	20		0.2	0.96	0.027	N.D.	U	0.2	0.047	0.027	N.D.	U	0.2	0.049	0.027
	Naphthalene	17	21	N.D.	U	0.2	0.048	0.023	N.D.	U	0.2	0.051	0.023	71		2.0	0.96	0.23	N.D.	U	0.2	0.047	0.023	N.D.	U	0.2	0.049	0.023
	Phenanthrene	240	410	N.D.	U	0.2	0.048	0.030	N.D.	U	0.2	0.051	0.031	N.D.	U	0.2	0.048	0.031	N.D.	U	0.2	0.047	0.030	N.D.	U	0.2	0.049	0.031
	Pyrene	180	68	N.D.	U	0.2	0.048	0.024	N.D.	U	0.2	0.051	0.025	N.D.	U	0.2	0.048	0.025	N.D.	U	0.2	0.047	0.024	N.D.	U	0.2	0.049	0.025
EPA 8260B	1,1,1,2-Tetrachloroethane	0.52	50,000	N.D.	U	1	0.5	0.4	N.D.	U	1	0.5	0.4	N.D.	U	1	0.5	0.4	N.D.	U	1	0.5	0.4	N.D.	U	1	0.5	0.4
	1,1,2,2-Tetrachloroethane ¹	0.067	500	N.D.	U	1	0.5	0.41	N.D.	U	1	0.5	0.41	N.D.	U	1	0.5	0.41	N.D.	U	1	0.5	0.41	N.D.	U	1	0.5	0.41
	1,1,1-Trichloroethane	200	970	N.D.	U	5	0.5	0.3	N.D.	U	5	0.5	0.3	N.D.	U	5	0.5	0.3	N.D.	U	5	0.5	0.3	N.D.	U	5	0.5	0.3
	1,1,2-Trichloroethane	5	50,000	N.D.	U	1	0.5	0.38	N.D.	U	1	0.5	0.38	N.D.	U	1	0.5	0.38	N.D.	U	1	0.5	0.38	N.D.	U	1	0.5	0.38
	1,1-Dichloroethane	2.4	50,000	N.D.	U	5	0.5	0.28	N.D.	U	5	0.5	0.28	N.D.	U	5	0.5	0.28	N.D.	U	5	0.5	0.28	N.D.	U	5	0.5	0.28
	1,1-Dichloroethylene	7	1,500	N.D.	U	1	0.5	0.43	N.D.	U	1	0.5	0.43	N.D.	U	1	0.5	0.43	N.D.	U	1	0.5	0.43	N.D.	U	1	0.5	0.43
	1,2,3-Trichloropropane ¹	0.6	50,000	N.D.	U	5	1	0.64	N.D.	U	5	1	0.64	N.D.	U	5	1	0.64	N.D.	U	5	1	0.64	N.D.	U	5	1	0.64
	1,2,4-Trichlorobenzene	70	3,000	N.D.	U	5	1	0.5	N.D.	U	5	1	0.5	N.D.	U	5	1	0.5	N.D.	U	5	1	0.5	N.D.	U	5	1	0.5
	1,2-Dibromo-3- chloropropane ¹	0.04	10	N.D.	U	10	2	1.2	N.D.	U	10	2	1.2	N.D.	U	10	2	1.2	N.D.	U	10	2	1.2	N.D.	U	10	2	1.2
	1,2-Dibromoethane ¹	0.04	50,000	N.D.	U	1	0.5	0.24	N.D.	U	1	0.5	0.24	N.D.	U	1	0.5	0.24	N.D.	U	1	0.5	0.24	N.D.	U	1	0.5	0.24
	1,2-Dichlorobenzene	600	10	N.D.	U	1	0.5	0.46	N.D.	U	1	0.5	0.46	N.D.	U	1	0.5	0.46	N.D.	U	1	0.5	0.46	N.D.	U	1	0.5	0.46
	1,2-Dichloroethane ¹	0.15	7,000	N.D.	U	1	0.5	0.24	N.D.	U	1	0.5	0.24	N.D.	U	1	0.5	0.24	N.D.	U	1	0.5	0.24	N.D.	U	1	0.5	0.24
	1,2-Dichloropropane	5	10	N.D.	U	5	0.5	0.42	N.D.	U	5	0.5	0.42	N.D.	U	5	0.5	0.42	N.D.	U	5	0.5	0.42	N.D.	U	5	0.5	0.42
	1,3-Dichlorobenzene	180	5	N.D.	U	1	0.5	0.4	N.D.	U	1	0.5	0.4	N.D.	U	1	0.5	0.4	N.D.	U	1	0.5	0.4	N.D.	U	1	0.5	0.4
	1,3-Dichloropropene (total of cis/trans) ¹	0.43	50,000	N.D.	U	1	0.5	0.25	N.D.	U	1	0.5	0.25	N.D.	U	1	0.5	0.25	N.D.	U	1	0.5	0.25	N.D.	U	1	0.5	0.25
	1,4-Dichlorobenzene	75	5	N.D.	U	1	0.5	0.43	N.D.	U	1	0.5	0.43	N.D.	U	1	0.5	0.43	N.D.	U	1	0.5	0.43	N.D.	U	1	0.5	0.43
	Acetone	22,000	20,000	N.D.	U, ICH	20	10	6	N.D.	U, ICH	20	10	6	N.D.	U, ICH	20	10	6	N.D.	U, ICH	20	10	6	N.D.	U, ICH	20	10	6
	Benzene	5	170	N.D.	U	1	0.5	0.14	N.D.	U	1	0.5	0.14	N.D.	U	1	0.5	0.14	N.D.	U	1	0.5	0.14	N.D.	U	1	0.5	0.14
	Bromodichloromethane ¹	0.12	50,000	N.D.	U	5	0.5	0.21	N.D.	U	5	0.5	0.21	N.D.	U	5	0.5	0.21	N.D.	U								

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SECTION 3 – DATA QUALITY ASSESSMENT

A data quality assessment, which consists of a review of the overall groundwater sample collection and analysis process, was performed in order to determine whether the analytical data generated met the quality objectives for the project. The data quality assessment was performed in accordance with the approved WP/SAP (ESI, 2012). The field quality control program consisted of standardized sample collection and management procedures, and the collection of field duplicate samples, matrix spike samples, and trip blank samples. The laboratory quality assurance program consisted of the use of standard analytical methods and the preparation and analyses of Matrix Spike [MS]/Matrix Spike Duplicate [MSD] samples, surrogate spikes, blanks, and Laboratory Control Samples [LCSs]/Laboratory Control Sample Duplicates [LCSDs].

3.1 DATA VALIDATION AND ASSESSMENT

The objective of data validation is to provide data of known quality for project decisions. Data quality is judged in terms of Precision, Accuracy, Representativeness, Completeness, Comparability, and Sensitivity [PARCCS]. A number of factors may affect the quality of data, including: sample collection methods, sample analysis methods, and adherence to established procedures for sample collection, preservation, management, shipment, and analysis.

Precision

Precision is defined as the reproducibility of replicate measurements. Precision is evaluated by Relative Percentage Difference [RPD] of field duplicates, LCS/LCSDs, and MS/MSD results. Field duplicate and MS/MSD samples were collected at a rate of approximately 10% of primary samples. Field duplicates were sent to the laboratory along with the primary samples.

The RPDs of detected analytes for the primary and field duplicate samples (ES104 and ES105) are provided in Table 3.1. A precision of less than 50% for duplicate pairs is required by the DoN Project Procedures Manual to be considered acceptable (DoN 2007). All duplicate RPDs are less than the acceptable maximum, except for lead. An RPD of 200% was assigned to the ES104 and ES105 lead results because lead was detected in only one of the replicate samples from the duplicate pair. The lead result for sample ES105 was below the LOQ; consequently, the RPD exceedance signified the anticipated decrease in precision below the LOQ, but was not indicative of a QC issue.

Lead was detected in only the duplicate sample ES105, and was assigned an RPD of 200%. However, the concentration detected was below the limit of quantitation [LOQ] and well below the DOH EALs. Therefore, it is unlikely to have an effect on data usability, and the data precision is considered acceptable. In addition, all RPDs for MS/MSD and LCS/LCSD pairs were also below the control limit.

Accuracy

Accuracy is defined as the degree of conformity of a measurement to a standard or true value. Accuracy is evaluated through measurement of the percent recovery of an analyte in a reference standard or spiked sample. Accuracy limits for surrogates, laboratory control spike, MS, and MSD samples are established by the individual laboratory.

Between July 2006 and July 2010, naphthalene was analyzed for by both EPA Methods 8260B and 8270C, and both results were reported. In September 2005 and in all data beginning in October 2010, only results using EPA Method 8270C were reported. Naphthalene has historically only been detected at concentrations above the DOH EALs in well RHMW02. In this well, concentrations of naphthalene detected in each sample by EPA Method 8260B were generally two to three times higher than those detected by EPA Method 8270C. We assume this is due to the better preservation of VOCs associated with the use of EPA Method 8260B. This suggests that the naphthalene results provided by EPA Method 8270C may be biased low. Since October 2012, naphthalene concentrations in RHMW02 have exceeded DOH EALs for both gross contamination and drinking water toxicity. The naphthalene concentration detected in July 2012 (17 µg/L) was equal to the DOH EAL for drinking water (17 µg/L) but below the DOH EAL for gross contamination (21 µg/L); it is possible that accounting for the low bias, the actual naphthalene concentration detected in July exceeded both EALs. Naphthalene concentrations between April 2011 and April 2012 were all an order of magnitude below both EALs, and it is unlikely that naphthalene concentrations in these samples exceeded the EALs, even after accounting for a potential low bias.

Results for TPH-d in samples ES103 through ES106 were flagged "HD." The laboratory indicated a mismatch between the calibration standard and the TPH-d chromatographic profile. Mismatches of this type are not uncommon. Even though chromatograms are not part of the standard laboratory package, ESI was able to review the chromatograms from RHMW02 dating back to October 2012. The chromatograms of groundwater samples from RHMW02 did not significantly differ between each event, but did not match a standard chromatogram of JP-8 in groundwater.

For this July 2014 sampling event, all of the LCS and surrogate spike recoveries for analyzed constituents were within acceptable percent recovery limits, except for the LCS percent recovery for acetone, which was above the recovery limit. This indicates acetone results may be biased high; however, acetone was only detected in the trip blank and not in any of the groundwater samples.

The MS and/or MSD recoveries were above the control limits for acetone and lead and the associated sample results may be biased high. Acetone was not detected in any of the groundwater samples and lead was only detected in ES105, at a concentration below the LOQ. Naphthalene, 2-methylnaphthalene and 1-methylnaphthalene concentrations for ES104, the primary sample on which the MS/MSD were performed, were significantly higher than the added spike concentration, which prevented an accurate evaluation of the MS/MSD recovery for these analytes.

All other MS/MSD recoveries were within acceptable recovery limits; therefore, the data accuracy for this monitoring event is considered acceptable.

Representativeness

Representativeness is the degree that data accurately and precisely represents a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness was achieved by conducting sampling in accordance with the sample collection procedures described in the project WP/SAP, including standardized sample collection methods (ESI, 2012).

Representativeness is also evaluated through the compliance with the standardized sample holding time and sample preservation methods, and through the analysis of blank samples, including method blank and trip blank samples. For this sampling event, all sample holding time and sample preservation were consistent with EPA guidance.

For this sampling event, one trip blank was included in every cooler containing samples for VOC and TPH-g analysis to assess the potential for contamination during sample transport. Two trip blanks were collected. Acetone was the only COPC detected, and in only one of the trip blanks; however, acetone was not detected in any of the groundwater samples, excluding the possibility that project samples were contaminated with acetone during handling or transport. Based on the assessment of representativeness, the groundwater sample data are considered representative of the groundwater quality on site. The trip blank results are provided in Table 3.1.

Completeness

Completeness is defined as the overall percentage of valid analytical results (including estimated results) compared to the total number of analytical results reported by the analytical laboratory. No data were rejected for this project, and therefore the completeness goal for this project (90%), was successfully met.

Comparability

Comparability expresses the confidence with which one data set can be compared to another data set. Comparability can be related to accuracy and precision because these quantities are measures of data reliability. Data with acceptable precision and accuracy are considered comparable if collection techniques, analytical procedures, methods and reporting are equivalent.

As noted above, between July 2006 and July 2010, naphthalene was analyzed for using both EPA Methods 8260B and 8270C, and in September 2005 and between October 2010 and the most recent event, only results using EPA Method 8270C were reported. In general, EPA Method 8260B resulted in higher, and as discussed above, likely more accurate, results than EPA Method 8270C. However, for the sake of comparability with results from recent events, EPA Method 8270C was used for naphthalene analysis in this event. Consequently, the low bias associated with Method 8270C should be considered when making project decisions.

All project samples for TPH-g analysis through July 2010 were analyzed by EPA Method 8015; beginning in October 2010, EPA Method 8260B was used. There was no event where both methods were used; consequently, there is no way to directly compare the results obtained by method and to assess potential bias. However, there is no reason to believe that using either method should bias the data, and the TPH-g data for all events should be comparable.

Other than the naphthalene bias discussed above, no issues with comparability were identified. The results are considered comparable within this data set and with the data collected from recent sampling events.

Sensitivity

The LOQs are established by the laboratory based on the limits of detection [LODs] or instrument detection limits, historical data, and EPA limits established for the various methods. The LOQs for samples may require adjustment by the laboratory due to matrix interference or if high levels of target analytes necessitate dilution before analysis. Matrix interference and sample dilutions have the effect of decreasing sensitivity and increasing the LOQs. Laboratory LODs and LOQs for several analytes (EPA Methods 8260 and 8270) for this event differed from the LODs and LOQs in the WP/SAP because the laboratory updates them quarterly and in some cases, dilution was necessary due to the presence of high concentrations of analytes.

For this event, LODs and LOQs for several analytes were greater than the DOH EALs (as stated in the WP/SAP), and therefore it would not be possible to detect the analytes at concentrations greater than the DOH EALs but below the LODs or LOQs. The lack of the required sensitivity should be considered when making project decisions. The affected analytes for this monitoring event are 1,2,3-trichloropropane, 1,2-dibromo-3-chloropropane, 1,2-dibromoethane, 1,2-dichloroethane, 1,3-dichloropropene, bromodichloromethane, chloromethane, dibromochloromethane, 1,1,2,2-tetrachloroethane, and dibenzo[a,h]anthracene.

3.2 DATA ASSESSMENT AND USABILITY CONCLUSIONS

The PARCCS criteria were evaluated, and with a few exceptions, all criteria were met. The data assessment concludes that all data generated during this event are usable for the intended purpose.

TABLE 3.1
Quality Control Results for Groundwater Sampling (July 21 and 22, 2014)
Red Hill Bulk Fuel Storage Facility
July 2014 Quarterly Monitoring Report

Method	Chemical Constituent	DOH EALs		RHMW02 (ES104)					RHMW02 (ES105) (DUP)					RPD Duplicate (%)	ES Trip (7/21/2014)					ES Trip (7/22/2014)					
		Drinking Water Toxicity	Gross Contamination	Result	Q	LOQ	LOD	DL	Result	Q	LOQ	LOD	DL		Result	Q	LOQ	LOD	DL	Result	Q	LOQ	LOD	DL	
EPA 8015B	TPH-d	190	100	1,200	HD	25	10	7.4	1,300	HD	25	10	7.4	8.00	-	-	-	-	-	-	-	-	-	-	
EPA 8260B	TPH-g	100	100	48	J	50	30	26	49	J	50	30	26	2.06	N.D.	U	50	30	26	N.D.	U	50	30	26	
EPA 8270C	Acenaphthene	370	20	0.52		0.2	0.048	0.021	0.50		0.2	0.05	0.021	3.92	-	-	-	-	-	-	-	-	-		
	Acenaphthylene	240	2,000	N.D.	U	0.2	0.048	0.018	N.D.	U	0.2	0.05	0.018	NA	-	-	-	-	-	-	-	-	-		
	Anthracene	1,800	22	N.D.	U	0.2	0.048	0.035	N.D.	U	0.2	0.05	0.034	NA	-	-	-	-	-	-	-	-	-		
	Benzo[a]anthracene	0.092	4.7	N.D.	U	0.2	0.048	0.024	N.D.	U	0.2	0.05	0.024	NA	-	-	-	-	-	-	-	-	-		
	Benzo[g,h,i]perylene	1,500	0.13	N.D.	U	0.2	0.048	0.022	N.D.	U	0.2	0.05	0.022	NA	-	-	-	-	-	-	-	-	-		
	Benzo[a]pyrene	0.2	0.81	N.D.	U	0.2	0.048	0.037	N.D.	U	0.2	0.05	0.036	NA	-	-	-	-	-	-	-	-	-		
	Benzo[b]fluoranthene	0.092	0.75	N.D.	U	0.2	0.048	0.025	N.D.	U	0.2	0.05	0.025	NA	-	-	-	-	-	-	-	-	-		
	Benzo[k]fluoranthene	0.92	0.4	N.D.	U	0.2	0.048	0.024	N.D.	U	0.2	0.05	0.023	NA	-	-	-	-	-	-	-	-	-		
	Chrysene	9.2	1	N.D.	U	0.2	0.048	0.019	N.D.	U	0.2	0.05	0.019	NA	-	-	-	-	-	-	-	-	-		
	Dibenzo[a,h]anthracene	0.0092	0.52	N.D.	U	0.2	0.048	0.027	N.D.	U	0.2	0.05	0.027	NA	-	-	-	-	-	-	-	-	-		
	Fluoranthene	1,500	130	N.D.	U	0.2	0.048	0.028	N.D.	U	0.2	0.05	0.027	NA	-	-	-	-	-	-	-	-	-		
	Fluorene	240	950	0.24		0.2	0.048	0.025	0.23		0.2	0.05	0.024	4.26	-	-	-	-	-	-	-	-	-		
	Indeno[1,2,3-cd]pyrene	0.092	0.095	N.D.	U	0.2	0.048	0.022	N.D.	U	0.2	0.05	0.022	NA	-	-	-	-	-	-	-	-	-		
	1-Methylnaphthalene	4.7	10	25		0.2	0.96	0.029	26		0.2	0.05	0.028	3.92	-	-	-	-	-	-	-	-	-		
	2-Methylnaphthalene	24	10	20		0.2	0.96	0.027	22		0.2	0.05	0.026	9.52	-	-	-	-	-	-	-	-	-		
	Naphthalene	17	21	71		2.0	0.96	0.23	76		2.0	0.5	0.23	6.80	-	-	-	-	-	-	-	-	-		
	Phenanthrene	240	410	N.D.	U	0.2	0.048	0.031	N.D.	U	0.2	0.05	0.030	NA	-	-	-	-	-	-	-	-	-		
	Pyrene	180	68	N.D.	U	0.2	0.048	0.025	N.D.	U	0.2	0.05	0.025	NA	-	-	-	-	-	-	-	-	-		
	EPA 8260B	1,1,1,2-Tetrachloroethane	0.52	50,000	N.D.	U	1	0.5	0.4	N.D.	U	1	0.5	0.4	NA	N.D.	U	1	0.5	0.4	N.D.	U	1	0.5	0.4
		1,1,2,2-Tetrachloroethane	0.067	500	N.D.	U	1	0.5	0.41	N.D.	U	1	0.5	0.41	NA	N.D.	U	1	0.5	0.41	N.D.	U	1	0.5	0.41
1,1,1-Trichloroethane		200	970	N.D.	U	5	0.5	0.3	N.D.	U	5	0.5	0.3	NA	N.D.	U	5	0.5	0.3	N.D.	U	5	0.5	0.3	
1,1,2-Trichloroethane		5	50,000	N.D.	U	1	0.5	0.38	N.D.	U	1	0.5	0.38	NA	N.D.	U	1	0.5	0.38	N.D.	U	1	0.5	0.38	
1,1-Dichloroethane		2.4	50,000	N.D.	U	5	0.5	0.28	N.D.	U	5	0.5	0.28	NA	N.D.	U	5	0.5	0.28	N.D.	U	5	0.5	0.28	
1,1-Dichloroethylene		7	1,500	N.D.	U	1	0.5	0.43	N.D.	U	1	0.5	0.43	NA	N.D.	U	1	0.5	0.43	N.D.	U	1	0.5	0.43	
1,2,3-Trichloropropane		0.6	50,000	N.D.	U	5	1	0.64	N.D.	U	5	1	0.64	NA	N.D.	U	5	1	0.64	N.D.	U	5	1	0.64	
1,2,4-Trichlorobenzene		70	3,000	N.D.	U	5	1	0.5	N.D.	U	5	1	0.5	NA	N.D.	U	5	1	0.5	N.D.	U	5	1	0.5	
1,2-Dibromo-3- chloropropane		0.04	10	N.D.	U	10	2	1.2	N.D.	U	10	2	1.2	NA	N.D.	U	10	2	1.2	N.D.	U	10	2	1.2	
1,2-Dibromoethane		0.04	50,000	N.D.	U	1	0.5	0.24	N.D.	U	1	0.5	0.24	NA	N.D.	U	1	0.5	0.24	N.D.	U	1	0.5	0.24	
1,2-Dichlorobenzene		600	10	N.D.	U	1	0.5	0.46	N.D.	U	1	0.5	0.46	NA	N.D.	U	1	0.5	0.46	N.D.	U	1	0.5	0.46	
1,2-Dichloroethane		0.15	7,000	N.D.	U	1	0.5	0.24	N.D.	U	1	0.5	0.24	NA	N.D.	U	1	0.5	0.24	N.D.	U	1	0.5	0.24	
1,2-Dichloropropane		5	10	N.D.	U	5	0.5	0.42	N.D.	U	5	0.5	0.42	NA	N.D.	U	5	0.5	0.42	N.D.	U	5	0.5	0.42	
1,3-Dichlorobenzene		180	5	N.D.	U	1	0.5	0.4	N.D.	U	1	0.5	0.4	NA	N.D.	U	1	0.5	0.4	N.D.	U	1	0.5	0.4	
1,3-Dichloropropene (total of cis/trans)		0.43	50,000	N.D.	U	1	0.5	0.25	N.D.	U	1	0.5	0.25	NA	N.D.	U	1	0.5	0.25	N.D.	U	1	0.5	0.25	
1,4-Dichlorobenzene		75	5	N.D.	U	1	0.5	0.43	N.D.	U	1	0.5	0.43	NA	N.D.	U	1	0.5	0.43	N.D.	U	1	0.5	0.43	
Acetone		22,000	20,000	N.D.	U, ICH	20	10	6	N.D.	U, IC	20	10	6	NA	6.5	J	20	10	6	N.D.	U, IC	20	10	6	
Benzene		5	170	N.D.	U	1	0.5	0.14	N.D.	U	1	0.5	0.14	NA	N.D.	U	1	0.5	0.14	N.D.	U	1	0.5	0.14	
Bromodichloromethane		0.12	50,000	N.D.	U	5	0.5	0.21	N.D.	U	5	0.5	0.21	NA	N.D.	U	5	0.5	0.21	N.D.	U	5	0.5	0.21	
Bromoform		80	510	N.D.	U	10	1	0.5	N.D.	U	10	1	0.5	NA	N.D.	U	10	1	0.5	N.D.	U	10	1	0.5	
Bromomethane		8.7	50,000	N.D.	U	20	5	3.9	N.D.	U, ICJ	20	5	3.9	NA	N.D.	U	20	5	3.9	N.D.	U, ICJ	20	5	3.9	
Carbon Tetrachloride		5	520	N.D.	U	1	0.5	0.23	N.D.	U	1	0.5	0.23	NA	N.D.	U	1	0.5	0.23	N.D.	U	1	0.5	0.23	
Chlorobenzene		100	50	N.D.	U	5	0.5	0.17	N.D.	U	5	0.5	0.17	NA	N.D.	U	5	0.5	0.17	N.D.	U	5	0.5	0.17	
Chloroethane		21,000	16	N.D.	U	10	5	2.3	N.D.	U	10	5	2.3	NA	N.D.	U	10	5	2.3	N.D.	U	10	5	2.3	
Chloroform		70	2,400	N.D.	U	5	0.5	0.46	N.D.	U	5	0.5	0.46	NA	N.D.	U	5	0.5	0.46	N.D.	U	5	0.5	0.46	
Chloromethane		1.8	50,000	N.D.	U, IJ	10	2	1.8	N.D.	U	10	2	1.8	NA	N.D.	U	10	2	1.8	N.D.	U	10	2	1.8	
cis-1,2-Dichloroethylene		70	50,000	N.D.	U	1	0.5	0.48	N.D.	U	1	0.5	0.48	NA	N.D.	U	1	0.5	0.48	N.D.	U	1	0.5	0.48	
Dibromochloromethane		0.16	50,000	N.D.	U	1	0.5	0.25	N.D.	U	1	0.5	0.25	NA	N.D.	U	1	0.5	0.25	N.D.	U	1	0.5	0.25	
Ethylbenzene		700	30	N.D.	J	1	0.5	0.14	N.D.	U	1	0.5	0.14	NA	N.D.	U	1	0.5	0.14	N.D.	U	1	0.5	0.14	
Hexachlorobutadiene		0.86	6	N.D.	U	1	0.5	0.32	N.D.	U	1	0.5	0.32	NA	N.D.	U	1	0.5	0.32	N.D.	U	1	0.5	0.32	
Methyl ethyl ketone (2-Butanone)		7,100	8,400	N.D.	U	10	5.0	2.2	N.D.	U	10	5.0	2.2	NA	N.D.	U	10	5.0	2.2	N.D.	U	10	5.0	2.2	
Methyl isobutyl ketone (4-Methyl-2-Pentanone)		2,000	1300	N.D.	U	10	5																		

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SECTION 4 – SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

On July 21 and 22, 2014, ESI personnel collected groundwater samples from four monitoring wells at the RHSF (wells RHMW01, RHMW02, RHMW03, and RHMW05) and one sampling point at Red Hill Shaft (RHMW2254-01).

The groundwater sampling was conducted as part of the long-term groundwater and soil vapor monitoring at the RHSF, under NAVFAC Contract Number N62742-12-D-1853. The sampling was conducted in accordance with the approved WP/SAP prepared by ESI. A summary of the analytical results is provided below.

- **RHMW01** – TPH-d (67 µg/L) was the only analyte detected. The TPH-d concentration detected did not exceed the DOH EALs or the SSRBL.
- **RHMW02** – TPH-d (1,200 and 1,300 µg/L), TPH-g (48 and 49 µg/L), xylenes (0.36 and 0.33 µg/L), acenaphthene (0.52 and 0.50 µg/L), fluorene (0.24 and 0.23 µg/L), 1-methylnaphthalene (25 and 26 µg/L), 2-methylnaphthalene (20 and 22 µg/L), and naphthalene (71 and 76 µg/L) were detected. TPH-d, 1-methylnaphthalene, and naphthalene were detected at concentrations above their respective DOH EALs for both drinking water toxicity and gross contamination. However, the TPH-d concentrations did not exceed the SSRBL. 2-Methylnaphthalene was detected at concentrations above the DOH EAL for gross contamination.
- **RHMW03** – TPH-d (37 µg/L) was the only analyte detected. None of the chemical constituents analyzed for were detected at concentrations above the DOH EALs or the SSRBLs.
- **RHMW05** – None of the chemical constituents analyzed for were detected.
- **RHMW2254-01** – None of the chemical constituents analyzed for were detected.

Acetone (6.5 µg/L) was detected in the trip blank submitted on July 21, 2014. Acetone was not detected in any of the groundwater samples, and this is not likely to affect data usability.

Groundwater Contaminant Trends

- **RHMW01** – COPCs detected during this round of quarterly sampling are consistent with the historical data for RHMW01. TPH-d has historically been detected at concentrations above the DOH EAL for both drinking water toxicity and gross contamination. TPH-d concentrations have shown an overall decreasing trend from a high of 1,500 µg/L in February 2005. The TPH-d concentration was last above the DOH EAL for gross contamination in a sample collected on April 7, 2014.

- **RHMW02** – COPCs detected during this round of quarterly sampling are consistent with the historical data for RHMW02. TPH-g, TPH-d, trichloroethylene, 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene have historically been detected at concentrations above the DOH EALs. TPH-d concentrations increased sharply from 2,400 µg/L to 5,100 µg/L during the additional sampling event on January 15, 2014, exceeding the SSRBL of 4,500 µg/L. During this July 2014 event, TPH-d concentrations decreased to an average of 1,250 µg/L but remained above both DOH EALs. The concentrations of 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene increased to their highest levels since January 2013. The concentrations of TPH-g remained below the DOH EALs for gross contamination and drinking water toxicity. Trichloroethylene has not been detected in RHMW02 since September 2005.
- **RHMW03** – COPCs detected during this round of quarterly sampling are consistent with the historical data for RHMW03. TPH-d has historically been detected at concentrations above the DOH EALs; however, it has not been detected at concentrations above the DOH EALs since October 2010.
- **RHMW05** – No COPCs were detected during this round of quarterly sampling. TPH-d has historically been detected in RHMW05 at concentrations above the DOH EAL for both drinking water toxicity and gross contamination; however, it has not been detected at concentrations above the DOH EALs since January 2010.
- **RHMW2254-01** – No COPCs were detected during this round of quarterly sampling. TPH-d was last detected in RHMW2254-01 at a concentration above the DOH EAL for gross contamination in January 2008. Although the method reporting limits for TPH-d exceeded one or both DOH EALs between May 2009 and July 2010, TPH-d has not been detected at concentrations above the DOH EALs since January 2008.

Conclusions and Recommendations

Between January and July 2014, the sampling frequency of the wells and monitoring point inside Red Hill increased, due to response activities related to a reported release at Tank 5. Since the previous quarterly sampling event in April 2014, three wells (RHMW01, RHMW02, and RHMW05) and one sampling point (RHMW2254-01) have each been sampled three times, including this quarterly event. During this period only TPH-d in RHMW01 and TPH-d, 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene in RHMW02 were detected at concentrations exceeding the DOH EALs. However, the TPH-d concentration detected in RHMW01 only exceeded the DOH EAL during the April 7, 2014 release response groundwater monitoring event. Groundwater contaminant concentrations in the other three wells (RHMW03, RHMW05, and RHMW2254-01) remained at low concentrations and did not change significantly, or were not detected.

Concentrations of 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene in RHMW02 show an increasing trend since March 5, 2014, but remain consistent with historical data. All other analytical results were generally consistent with historical data.

Based on the groundwater monitoring results and the reported release at Tank 5 in January 2014, continued groundwater monitoring at the wells inside the RHSF tunnel is recommended. The next quarterly event is tentatively scheduled for October 2014.

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SECTION 5 – FUTURE WORK

Future work includes the fourth quarter 2014 groundwater monitoring which is tentatively scheduled for October 2014. A quarterly groundwater monitoring report will be prepared to document the sampling event.

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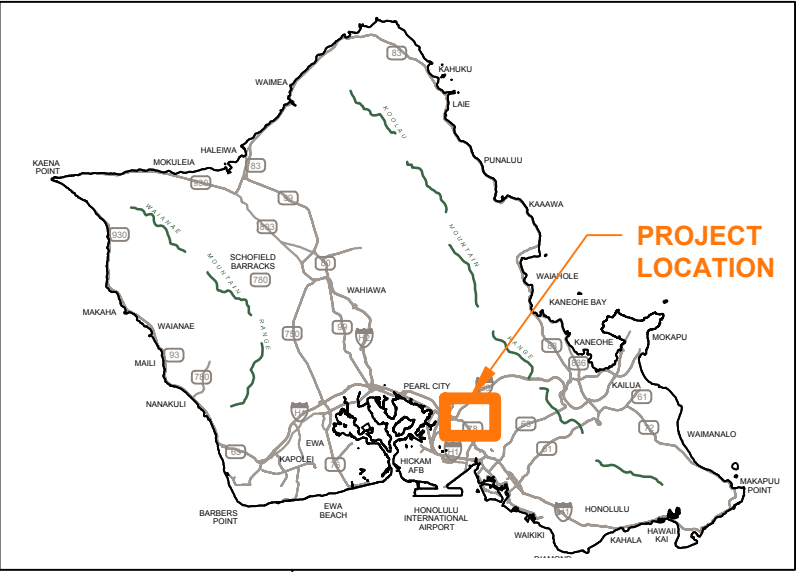
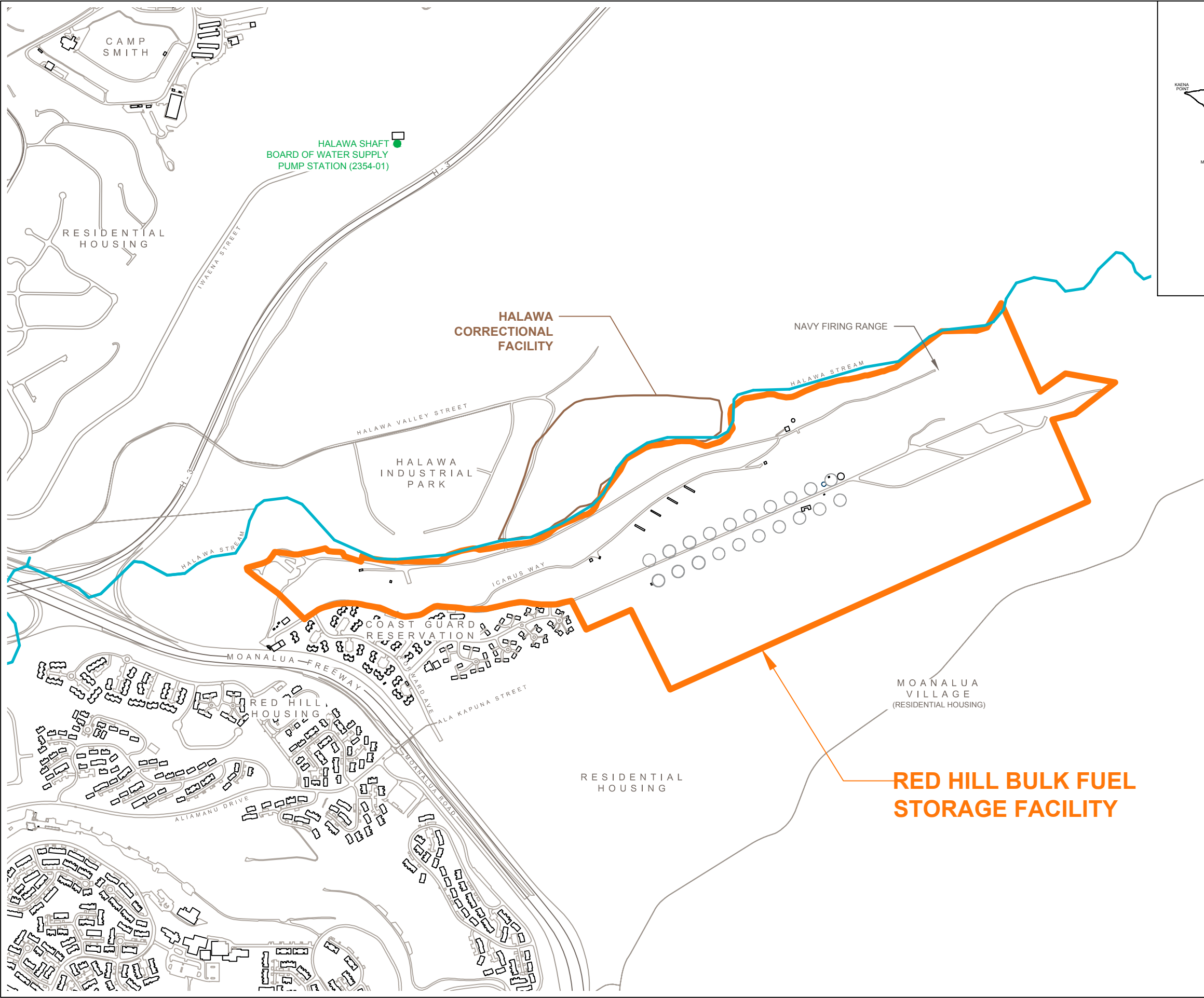
TEC, 2008, Final Groundwater Protection Plan, Red Hill Fuel Storage Facility, Prepared for Navy Region Hawaii, Pearl Harbor, Hawaii, January 2008, revised December 2009.

TEC, 2009, Quarterly Groundwater Monitoring Report, Red Hill Fuel Storage Facility, Prepared for Navy Region Hawaii, Pearl Harbor, Hawaii, September 2009.

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FIGURES

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NOTES
The accuracy of this document is limited to the quality and scale of the source information. This document is not a legal representation of an engineered survey.
SOURCES
Pearl Harbor Base Map
Navy GIS files

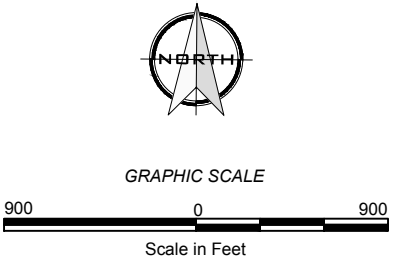
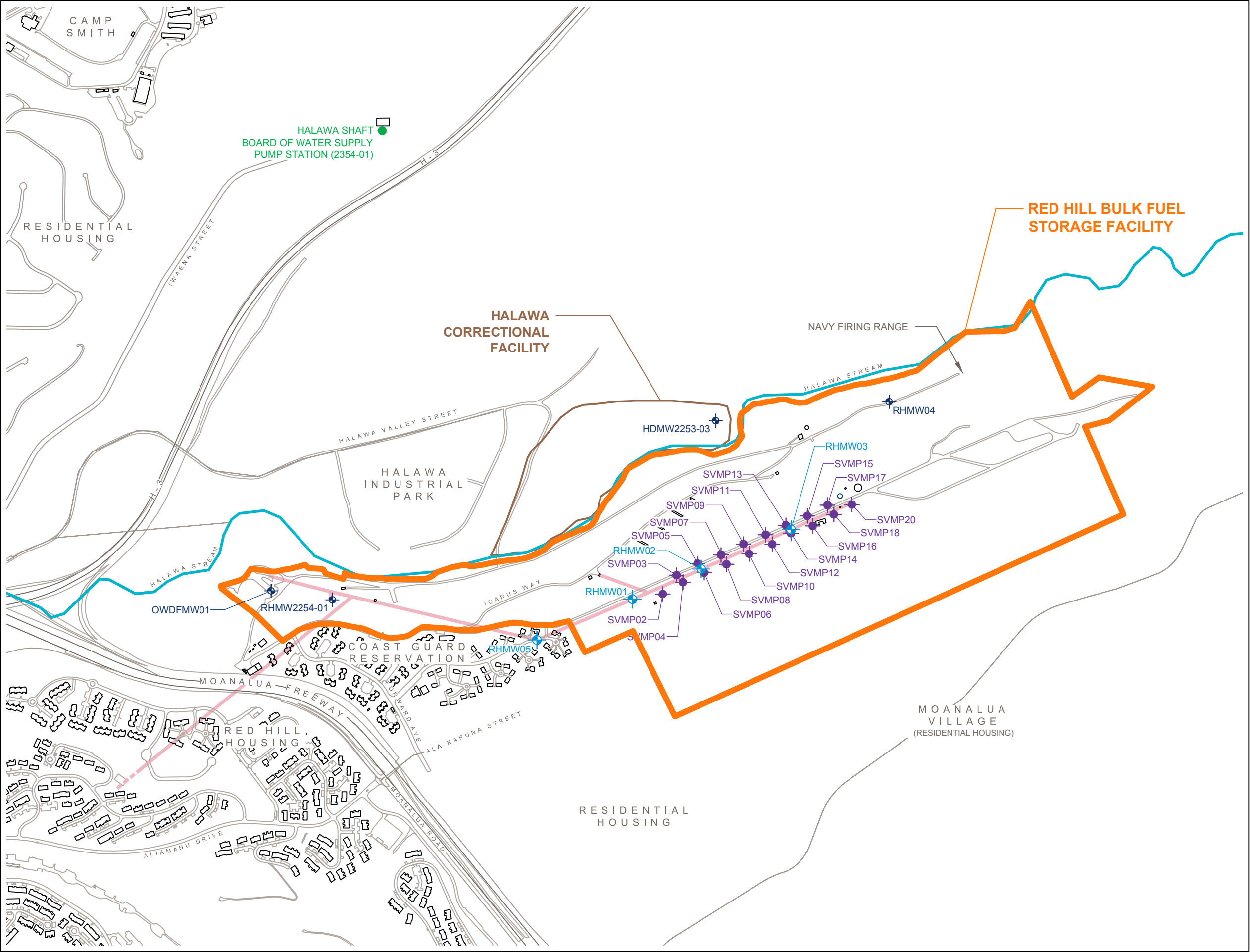


FIGURE 1
SITE LOCATION
GROUNDWATER MONITORING
RED HILL BULK FUEL STORAGE FACILITY
NAVAL SUPPLY SYSTEM COMMAND (NAVSUP)
FLEET LOGISTICS CENTER
JBPHH, OAHU, HAWAII

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LEGEND	
	RED HILL BULK FUEL STORAGE FACILITY
	HALAWA CORRECTIONAL FACILITY
	HALAWA STREAM
	BUILDING
	ROAD
	ABOVEGROUND STORAGE TANK
	WATER TANK
	SOIL VAPOR MONITORING POINT
	GROUNDWATER MONITORING WELL LOCATED INSIDE TUNNEL
	GROUNDWATER MONITORING WELL LOCATED OUTSIDE TUNNEL
	BOARD OF WATER SUPPLY PUMP STATION
	TUNNEL

NOTES
The accuracy of this document is limited to the quality and scale of the source information. This document is not a legal representation of an engineered survey.

SOURCES
Pearl Harbor Base Map
Navy GIS files

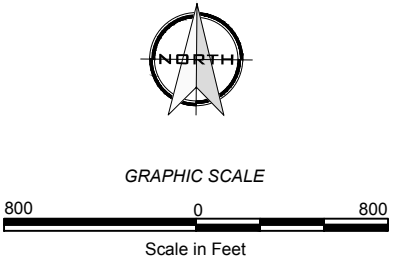


FIGURE 2
SITE LAYOUT
GROUNDWATER MONITORING
RED HILL BULK FUEL STORAGE FACILITY
NAVAL SUPPLY SYSTEM COMMAND (NAVSUP)
FLEET LOGISTICS CENTER
JBPHH, OAHU, HAWAII

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APPENDIX A

Groundwater Sampling Logs

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Groundwater Sampling Log

Well ID: RHMW01 Location: Red Hill Bulk Fuel Storage Facility Project No.: 112066

Initial Water Level: 84.13 ft Date: 7/21/2014 Time: 830

Total Depth of Well: 97.35 ft Personnel Involved: Justin Lam, Jeff Hattermer

Length of Saturated Zone: 13.22 ft Weather Conditions: Not applicable – well is located indoors

Volume of Water to be Removed: 2.5 L Method of Removal: Bladder Pump

Water Level After Purging: 84.13 ft Pumping Rate: 0.17 L/min

Well Purge Data:

Time	Volume Removed	pH	Conductivity (mS/cm)	DO (mg/l)	Temperature	Salinity	Redox (ORP) (mV)
837	0.0 L	7.77	0.343	7.60	25.6	-	95.1
840	0.5 L	7.20	0.35	7.12	25.33	-	56.1
843	1.0 L	7.12	0.351	4.07	25.18	-	36.2
846	1.5 L	7.07	0.352	2.33	25.00	-	-6.7
849	2.0 L	7.05	0.352	2.3	25.05	-	-7.1
854	2.5 L	7.06	0.352	2.28	25.10	-	-7.3

Sample Withdrawal Method: Bladder Pump

Appearance of Sample:

Color: Clear

Turbidity: Low

Sediment: None

Other: None

Laboratory Analysis Parameters and Preservatives: TPH-d - 8015; TPH-g, VOCs - 8260; PAHs - 8270c sim; lead - 6020

Number and Types of Sample Containers: 6 - 40ml VOAs, 2 - 1L amber jar, 1 - 500ml amber jar, 1 - 250ml HDPE

Sample Identification Numbers: ES103 [0855]

Decontamination Procedures: Triple Rinsed

Notes: YSI did not have salinity parameter.

Sampled by: Justin Lam, Jeff Hattermer

Sampled Delivered to: Calscience Environmental Lab Transporters: FedEx

Date: 7/21/2014 Time: 1200

Capacity of Casing (Gallons/Linear Feet)
2"-0.16 • 4"-0.65 • 8"-2.61 • 10"-4.08 • 12"-5.87



Groundwater Sampling Log

Well ID: RHMW02 Location: Red Hill Bulk Fuel Storage Facility Project No.: 112066

Initial Water Level: 86.80 ft Date: 7/21/2014 Time: 936

Total Depth of Well: 92.91 ft Personnel Involved: Justin Lam, Jeff Hattemer

Length of Saturated Zone: 6.11 ft Weather Conditions: Not applicable – well is located indoors

Volume of Water to be Removed: 2.0 L Method of Removal: Bladder Pump

Water Level After Purging: 86.80 ft Pumping Rate: 0.17 L/min

Well Purge Data:

Time	Volume Removed	pH	Conductivity (mS/cm)	DO (mg/l)	Temperature	Salinity	Redox (ORP) (mV)
944	0.0 L	7.09	0.581	0.50	24.12	-	-163.9
947	0.5 L	7.07	0.582	0.48	24.04	-	-162.7
950	1.0 L	7.05	0.585	0.41	24.00	-	-151.8
953	1.5 L	7.04	0.590	0.40	23.95	-	-150.6
953	2.0 L	7.04	0.590	0.40	23.96	-	-149.7

Sample Withdrawal Method: Bladder Pump

Appearance of Sample:

Color: Clear

Turbidity: Low

Sediment: None

Other: None

Laboratory Analysis Parameters and Preservatives: TPH-d - 8015; TPH-g, VOCs - 8260; PAHs - 8270c sim; lead - 6020

Number and Types of Sample Containers: 16 - 40ml VOAs, 6 - 1L amber jar, 4 - 500ml amber jar, 4 - 500ml HDPE

Sample Identification Numbers: ES104 [1000], ES104 MS/MSD [1000], ES105 (Dup) [1055]

Decontamination Procedures: Triple Rinsed

Notes: YSI did not have salinity parameter.

Sampled by: Justin Lam, Jeff Hattemer

Sampled Delivered to: Calscience Environmental Lab Transporters: FedEx

Date: 7/21/2014 Time: 1200

Capacity of Casing (Gallons/Linear Feet)
2"-0.16 • 4"-0.65 • 8"-2.61 • 10"-4.08 • 12"-5.87



Groundwater Sampling Log

Well ID: RHMW03 Location: Red Hill Bulk Fuel Storage Facility Project No.: 112066

Initial Water Level: 102.98 ft Date: 7/22/2014 Time: 1100

Total Depth of Well: 110.12 ft Personnel Involved: Justin Lam, Jeff Hattermer

Length of Saturated Zone: 7.14 ft Weather Conditions: Not applicable – well is located indoors

Volume of Water to be Removed: 4.0 L Method of Removal: Bladder Pump

Water Level After Purging: 102.98 ft Pumping Rate: 0.33 L/min

Well Purge Data:

Time	Volume Removed	pH	Conductivity (mS/cm)	DO (mg/l)	Temperature	Salinity	Redox (ORP) (mV)
1105	0.0 L	6.71	0.743	2.40	26.90	-	123.5
1108	1.0 L	6.72	0.742	2.25	26.87	-	110.5
1111	2.0 L	6.76	0.746	1.64	26.61	-	84.0
1114	3.0 L	6.76	0.746	1.60	26.64	-	79.9
1117	4.0 L	6.78	0.746	1.61	26.60	-	76.0

Sample Withdrawal Method: Bladder Pump

Appearance of Sample:

Color: Clear

Turbidity: Low

Sediment: None

Other: None

Laboratory Analysis Parameters and Preservatives: TPH-d - 8015; TPH-g, VOCs - 8260; PAHs - 8270c sim; lead - 6020

Number and Types of Sample Containers: 6 - 40ml VOAs, 2 - 1L amber jar, 1 - 500ml amber jar, 1 - 250ml HDPE

Sample Identification Numbers: ES106 [1120]

Decontamination Procedures: Triple Rinsed

Notes: YSI did not have salinity parameter.

Sampled by: Justin Lam, Jeff Hattermer

Sampled Delivered to: Calscience Environmental Lab Transporters: FedEx

Date: 7/22/2014 Time: 1215

Capacity of Casing (Gallons/Linear Feet)
2"-0.16 • 4"-0.65 • 8"-2.61 • 10"-4.08 • 12"-5.87



Groundwater Sampling Log

Well ID: RHMW05 Location: Red Hill Bulk Fuel Storage Facility Project No.: 112066

Initial Water Level: 83.49 ft Date: 7/22/2014 Time: 1013

Total Depth of Well: Unable to Measure Personnel Involved: Justin Lam, Jeff Hattermer

Length of Saturated Zone: Unknown Weather Conditions: Not applicable – well is located indoors

Volume of Water to be Removed: 4.0 L Method of Removal: Bladder Pump

Water Level After Purging: 83.49 ft Pumping Rate: 0.33 L/min

Well Purge Data:

Time	Volume Removed	pH	Conductivity (mS/cm)	DO (mg/l)	Temperature	Salinity	Redox (ORP) (mV)
1018	0.0 L	7.73	0.837	9.60	23.67	-	98.9
1021	1.0 L	7.64	0.839	8.42	23.40	-	90.7
1024	2.0 L	7.58	0.836	7.98	22.79	-	68.9
1027	3.0 L	7.54	0.836	7.80	22.68	-	67.1
1030	4.0 L	7.53	0.830	7.80	22.66	-	66.8

Sample Withdrawal Method: Bladder Pump

Appearance of Sample:

Color: Clear
Turbidity: Clear
Sediment: None
Other: None

Laboratory Analysis Parameters and Preservatives: TPH-d - 8015; TPH-g, VOCs - 8260; PAHs - 8270c sim; lead - 6020

Number and Types of Sample Containers: 6 - 40ml VOAs, 2 - 1L amber jar, 1 - 500ml amber jar, 1 - 250ml HDPE

Sample Identification Numbers: ES108 [1035]

Decontamination Procedures: Triple Rinsed

Notes: YSI did not have salinity parameter.

Sampled by: Justin Lam, Jeff Hattermer

Sampled Delivered to: Calscience Environmental Lab Transporters: FedEx

Date: 7/22/2014 Time: 1215

Capacity of Casing (Gallons/Linear Feet)
2"-0.16 • 4"-0.65 • 8"-2.61 • 10"-4.08 • 12"-5.87



Groundwater Sampling Log

Well ID: RHMW2254-01 Location: Red Hill Bulk Fuel Storage Facility Project No.: 112066

Initial Water Level: 82.19 ft Date: 7/22/2014 Time: 915

Total Depth of Well: Not applicable Personnel Involved: Justin Lam, Jeff Hattermer

Length of Saturated Zone: Not applicable Weather Conditions: Not applicable – well is located indoors

Volume of Water to be Removed: 4.0 L Method of Removal: Bladder Pump

Water Level After Purging: 82.19 ft Pumping Rate: 0.33 L/min

Well Purge Data:

Time	Volume Removed	pH	Conductivity (mS/cm)	DO (mg/l)	Temperature	Salinity	Redox (ORP) (mV)
920	0.0 L	7.60	0.504	7.92	23.03	-	45.4
923	1.0 L	7.34	0.525	7.55	22.52	-	29.1
926	2.0 L	7.30	0.527	7.53	22.44	-	27.9
929	3.0 L	7.32	0.527	7.52	22.41	-	27.7
932	4.0 L	7.31	0.527	7.52	22.41	-	27.6

Sample Withdrawal Method: Bladder Pump

Appearance of Sample:

Color: Clear
Turbidity: Clear
Sediment: None
Other: None

Laboratory Analysis Parameters and Preservatives: TPH-d - 8015; TPH-g, VOCs - 8260; PAHs - 8270c sim; lead - 200.8

Number and Types of Sample Containers: 6 - 40ml VOAs, 2 - 1L amber jar, 1 - 500ml amber jar, 1 - 250ml HDPE

Sample Identification Numbers: ES107, ES107 UF [0945]

Decontamination Procedures: Triple Rinsed

Notes: YSI did not have salinity parameter.

Sampled by: Justin Lam, Jeff Hattermer

Sampled/Delivered to: CalScience Environmental Lab Transporters: FedEx

Date: 7/22/2014 Time: 1215

Capacity of Casing (Gallons/Linear Feet)
2"-0.16 • 4"-0.65 • 8"-2.61 • 10"-4.08 • 12"-5.87

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APPENDIX B

Field Notes

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RHSF

7/21/14

NAVFAC

Purpose: GW, SV sampling

Personnel: JHJL

0800 @ RHSF, Calibrate BID Safety net

0810 Enter tunnel

0830 @ RHMW01, DTW = 84.13' b foci

0855 Collected ES103 - 2.5 L purged

0936 @ RHMW02, DTW = 86.80' b foci

1000 Collected samples ES104, ES104 MS/MS
and duplicate ES105 (recorded
as 1055).

RHSF

7/21/14

NAVFAC

0822	Begin	purge	SUMP02		
Shallow	556	513	481	556	527
Mid	423	382	339	423	392
Deep	426	397	440	440	426
0836	Begin	purge	SUMP03		
shallow	922	1000	1078	1084	1021
mid	1032	1162	1133	1203	1133
deep	1136	1200	1261	1261	1215
0856	Begin	purge	SUMP04		
shallow	571	522	565	571	557
mid	620	556	626	698	625
deep	797	707	638	797	735
0914	Begin	purge	SUMP05		
shallow	107	111	113	113	111
mid	237	232	231	237	234
deep	239	235	233	239	237
0941	Begin	purge	SUMP06		
shallow	20.6	21.9	22.5	22.5	21.9
mid	20.1	21.6	22.3	22.3	21.6
0958	Begin	purge	SUMP07		
shallow	33.0	35.4	35.5	35.5	34.9
mid	blacked.	No	Sample.		
deep	23.8	25.3	25.3	25.3	24.9
A = BPM					

1015	Begin	purge	SUMPOS			
shallow	12.3	13.2	13.7	13.7	13.2	★
mid	15.7	16.5	16.9	16.9	16.5	A
deep	14.6	17.0	17.8	17.8	16.8	A
1035	Begin	purge	SUMP 09			
shallow	5957	6450	6714	6714	6459	
mid	9652	9872	10.2	10.2	9981	
deep	10.8	12.0	12.6	12.6	12.0	★
1051	Begin	purge	SUMP 10			
shallow	3123	3346	3433	3433	3334	
deep	3494	3622	3722	3722	3640	
1120	Depart Tunnel.					
1150	Pack samples, dump off water @ Act 3, head to					
	Pod Ex.					
1225	Dropped off samples @ Pod Ex					

JH
7/21/14

Purpose: SV, GW Sampling
 Personnel: JH, JL
 0740 @ RHSE. Calibrate PID.
 Safety meeting
 0755 Enter tunnel.
 0830 @ Pump House.
 0845 Call Rodney. Worker got a flat tire. Will be later
 0915 @ RH MW 2254-01, DTW = 82.19' bbl.
 0945 Collected sample ES107; ES107UF
 1013 @ RH MW 05, DTW = 83.49' bbl.
 1035 Collected ES108.
 @ RH MW 03, DTW = 102.98' bbl.
 1120 Collected sample ES106.

RHSE

7/22/14

NAVFAC

0805	Begin	purge	SUMP 20		
shallow	1454	1551	1671	1671	1587
mid	1751	1906	1889	1960	1877
deep	2057	2274	2246	2274	2213

0825	Begin	purge	SUMP 18		
shallow	1243	1423	1614	1614	1474
deep	2454	2812	3012	3012	2823

0842	Begin	purge	SUMP 17		
shallow	1346	1586	1689	1689	1578
mid	1823	2103	2349	2349	2156
deep	2403	2760	3026	3026	2804

0906	Begin	purge	SUMP 16		
shallow	477	560	585	585	552
mid	391	440	494	494	455
deep	414	431	554	554	488

0924	Begin	purge	SUMP 15		
shallow	611	634	703	703	663
mid	mid	blocked	No sample		
deep	1151	1306	1414	1414	1321

0938	Begin	purge	SUMP 14		
shallow	277	305	351	360	323
mid	374	482	520	520	474
deep	531	594	705	705	634

RHSE

7/22/14 63

NAVFAC

0955	Begin	purge	SUMP 13		
shallow	414	531	505	531	495
mid	637	800	911	911	815
deep	1103	1211	1225	1225	1191

1013	Begin	purge	SUMP 12		
shallow	160	242	237	290	232
mid	222	222	194	228	217
deep	228	302	311	317	290

1030	Begin	purge	SUMP 11		
mid	225	242	231	261	240
deep	blocked	No sample			

1145 Depart funnel.
Finish packing samples,
dump water in drum @
OWS.

1215 Depart to Fed Ex.

JH

7/22/14

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APPENDIX C

Laboratory Reports

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Calscience



WORK ORDER NUMBER: 14-07-1466

The difference is service



AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For

Client: Environmental Science International, Inc.

Client Project Name: Red Hill LTM 112066

Attention: Domonkos Feher, Ph.D.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Richard Villafania

Approved for release on 07/30/2014 by:
Richard Villafania
Project Manager

ResultLink ▶

Email your PM ▶



Eurofins Calscience, Inc. (Calscience) certifies that the test results provided in this report meet all NELAC requirements for parameters for which accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The original report of subcontracted analyses, if any, is attached to this report. The results in this report are limited to the sample(s) tested and any reproduction thereof must be made in its entirety. The client or recipient of this report is specifically prohibited from making material changes to said report and, to the extent that such changes are made, Calscience is not responsible, legally or otherwise. The client or recipient agrees to indemnify Calscience for any defense to any litigation which may arise.

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 Work Order Number: 14-07-1466

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Work Order Narrative

Work Order: 14-07-1466

Page 1 of 1

Condition Upon Receipt:

Samples were received under Chain-of-Custody (COC) on 07/22/14. They were assigned to Work Order 14-07-1466.

Unless otherwise noted on the Sample Receiving forms all samples were received in good condition and within the recommended EPA temperature criteria for the methods noted on the COC. The COC and Sample Receiving Documents are integral elements of the analytical report and are presented at the back of the report.

Holding Times:

All samples were analyzed within prescribed holding times (HT) and/or in accordance with the Calscience Sample Acceptance Policy unless otherwise noted in the analytical report and/or comprehensive case narrative, if required.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of ≤ 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

Quality Control:

All quality control parameters (QC) were within established control limits except where noted in the QC summary forms or described further within this report.

Additional Comments:

Air - Sorbent-extracted air methods (EPA TO-4A, EPA TO-10, EPA TO-13A, EPA TO-17): Analytical results are converted from mass/sample basis to mass/volume basis using client-supplied air volumes.

New York NELAP air certification does not certify for all reported methods and analytes, reference the accredited items here: http://www.calscience.com/PDF/New_York.pdf

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are always reported on a wet weight basis.

Subcontractor Information:

Unless otherwise noted below (or on the subcontract form), no samples were subcontracted.



Calscience

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/22/14
Work Order: 14-07-1466
Preparation: EPA 3510C
Method: EPA 8015B (M)
Units: ug/L

Project: Red Hill LTM 112066

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES103	14-07-1466-1-I	07/21/14 08:55	Aqueous	GC 45	07/23/14	07/24/14 21:13	140723B11A

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>DL</u>	<u>LOD</u>	<u>LOQ</u>	<u>DF</u>	<u>Qualifiers</u>
TPH as Diesel	67	11	12	25	1.00	HD

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
n-Octacosane	127	51-141	

ES104	14-07-1466-2-I	07/21/14 10:00	Aqueous	GC 45	07/23/14	07/24/14 21:30	140723B11A
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>DL</u>	<u>LOD</u>	<u>LOQ</u>	<u>DF</u>	<u>Qualifiers</u>
TPH as Diesel	1200	11	12	25	1.00	HD

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
n-Octacosane	110	51-141	

ES105	14-07-1466-3-I	07/21/14 10:55	Aqueous	GC 45	07/23/14	07/24/14 21:48	140723B11A
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>DL</u>	<u>LOD</u>	<u>LOQ</u>	<u>DF</u>	<u>Qualifiers</u>
TPH as Diesel	1300	11	12	25	1.00	HD

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
n-Octacosane	135	51-141	

Method Blank	099-15-516-158	N/A	Aqueous	GC 45	07/23/14	07/24/14 18:11	140723B11A
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>DL</u>	<u>LOD</u>	<u>LOQ</u>	<u>DF</u>	<u>Qualifiers</u>
TPH as Diesel	<12	11	12	25	1.00	U

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
n-Octacosane	101	51-141	

Return to Contents



Calscience

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/22/14
Work Order: 14-07-1466
Preparation: EPA 3005A Filt.
Method: EPA 6020
Units: mg/L

Project: Red Hill LTM 112066

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES103	14-07-1466-1-J	07/21/14 08:55	Aqueous	ICP/MS 04	07/23/14	07/24/14 19:50	140723L03D

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Lead	<0.000200	0.0000898	0.000200	0.00100	1.00	U

ES104	14-07-1466-2-J	07/21/14 10:00	Aqueous	ICP/MS 04	07/23/14	07/24/14 19:48	140723L03D
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Lead	<0.000200	0.0000898	0.000200	0.00100	1.00	U

ES105	14-07-1466-3-J	07/21/14 10:55	Aqueous	ICP/MS 04	07/23/14	07/24/14 19:52	140723L03D
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Lead	0.000170	0.0000898	0.000200	0.00100	1.00	J

Method Blank	099-14-497-87	N/A	Aqueous	ICP/MS 04	07/23/14	07/24/14 19:24	140723L03D
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Lead	<0.000200	0.0000898	0.000200	0.00100	1.00	U

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Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/22/14
Work Order: 14-07-1466
Preparation: EPA 3510C
Method: EPA 8270C SIM PAHs
Units: ug/L

Project: Red Hill LTM 112066

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES103	14-07-1466-1-G	07/21/14 08:55	Aqueous	GC/MS AAA	07/28/14	07/29/14 16:17	140728L01

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Naphthalene	<0.051	0.024	0.051	0.20	1.00	U
2-Methylnaphthalene	<0.051	0.027	0.051	0.20	1.00	U
1-Methylnaphthalene	<0.051	0.029	0.051	0.20	1.00	U
Acenaphthylene	<0.051	0.018	0.051	0.20	1.00	U
Acenaphthene	<0.051	0.021	0.051	0.20	1.00	U
Fluorene	<0.051	0.025	0.051	0.20	1.00	U
Phenanthrene	<0.051	0.031	0.051	0.20	1.00	U
Anthracene	<0.051	0.035	0.051	0.20	1.00	U
Fluoranthene	<0.051	0.028	0.051	0.20	1.00	U
Pyrene	<0.051	0.025	0.051	0.20	1.00	U
Benzo (a) Anthracene	<0.051	0.024	0.051	0.20	1.00	U
Chrysene	<0.051	0.019	0.051	0.20	1.00	U
Benzo (k) Fluoranthene	<0.051	0.024	0.051	0.20	1.00	U
Benzo (b) Fluoranthene	<0.051	0.025	0.051	0.20	1.00	U
Benzo (a) Pyrene	<0.051	0.037	0.051	0.20	1.00	U
Indeno (1,2,3-c,d) Pyrene	<0.051	0.022	0.051	0.20	1.00	U
Dibenz (a,h) Anthracene	<0.051	0.027	0.051	0.20	1.00	U
Benzo (g,h,i) Perylene	<0.051	0.022	0.051	0.20	1.00	U

Surrogate	Rec. (%)	Control Limits	Qualifiers
Nitrobenzene-d5	75	28-139	
2-Fluorobiphenyl	76	33-144	
p-Terphenyl-d14	73	23-160	

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Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/22/14
Work Order: 14-07-1466
Preparation: EPA 3510C
Method: EPA 8270C SIM PAHs
Units: ug/L

Project: Red Hill LTM 112066

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES104	14-07-1466-2-G	07/21/14 10:00	Aqueous	GC/MS AAA	07/28/14	07/29/14 16:41	140728L01

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Acenaphthylene	<0.048	0.017	0.048	0.19	1.00	U
Acenaphthene	0.52	0.020	0.048	0.19	1.00	
Fluorene	0.24	0.023	0.048	0.19	1.00	
Phenanthrene	<0.048	0.029	0.048	0.19	1.00	U
Anthracene	<0.048	0.033	0.048	0.19	1.00	U
Fluoranthene	<0.048	0.026	0.048	0.19	1.00	U
Pyrene	<0.048	0.024	0.048	0.19	1.00	U
Benzo (a) Anthracene	<0.048	0.023	0.048	0.19	1.00	U
Chrysene	<0.048	0.018	0.048	0.19	1.00	U
Benzo (k) Fluoranthene	<0.048	0.022	0.048	0.19	1.00	U
Benzo (b) Fluoranthene	<0.048	0.024	0.048	0.19	1.00	U
Benzo (a) Pyrene	<0.048	0.035	0.048	0.19	1.00	U
Indeno (1,2,3-c,d) Pyrene	<0.048	0.021	0.048	0.19	1.00	U
Dibenz (a,h) Anthracene	<0.048	0.026	0.048	0.19	1.00	U
Benzo (g,h,i) Perylene	<0.048	0.021	0.048	0.19	1.00	U

Surrogate	Rec. (%)	Control Limits	Qualifiers
Nitrobenzene-d5	82	28-139	
2-Fluorobiphenyl	79	33-144	
p-Terphenyl-d14	79	23-160	

ES104	14-07-1466-2-G	07/21/14 10:00	Aqueous	GC/MS AAA	07/28/14	07/29/14 21:31	140728L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Naphthalene	71	0.44	0.96	3.8	20.0	
2-Methylnaphthalene	20	0.51	0.96	3.8	20.0	
1-Methylnaphthalene	25	0.54	0.96	3.8	20.0	

Surrogate	Rec. (%)	Control Limits	Qualifiers
Nitrobenzene-d5	65	28-139	
2-Fluorobiphenyl	77	33-144	
p-Terphenyl-d14	52	23-160	



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Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/22/14
Work Order: 14-07-1466
Preparation: EPA 3510C
Method: EPA 8270C SIM PAHs
Units: ug/L

Project: Red Hill LTM 112066

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES105	14-07-1466-3-G	07/21/14 10:55	Aqueous	GC/MS AAA	07/28/14	07/29/14 17:05	140728L01

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Acenaphthylene	<0.051	0.018	0.051	0.20	1.00	U
Acenaphthene	0.50	0.021	0.051	0.20	1.00	
Fluorene	0.23	0.025	0.051	0.20	1.00	
Phenanthrene	<0.051	0.031	0.051	0.20	1.00	U
Anthracene	<0.051	0.035	0.051	0.20	1.00	U
Fluoranthene	<0.051	0.028	0.051	0.20	1.00	U
Pyrene	<0.051	0.025	0.051	0.20	1.00	U
Benzo (a) Anthracene	<0.051	0.024	0.051	0.20	1.00	U
Chrysene	<0.051	0.019	0.051	0.20	1.00	U
Benzo (k) Fluoranthene	<0.051	0.024	0.051	0.20	1.00	U
Benzo (b) Fluoranthene	<0.051	0.025	0.051	0.20	1.00	U
Benzo (a) Pyrene	<0.051	0.037	0.051	0.20	1.00	U
Indeno (1,2,3-c,d) Pyrene	<0.051	0.022	0.051	0.20	1.00	U
Dibenz (a,h) Anthracene	<0.051	0.027	0.051	0.20	1.00	U
Benzo (g,h,i) Perylene	<0.051	0.022	0.051	0.20	1.00	U

Surrogate	Rec. (%)	Control Limits	Qualifiers
Nitrobenzene-d5	85	28-139	
2-Fluorobiphenyl	80	33-144	
p-Terphenyl-d14	79	23-160	

ES105	14-07-1466-3-G	07/21/14 10:55	Aqueous	GC/MS AAA	07/28/14	07/29/14 21:55	140728L01
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Naphthalene	76	0.47	1.0	4.1	20.0	
2-Methylnaphthalene	22	0.54	1.0	4.1	20.0	
1-Methylnaphthalene	26	0.57	1.0	4.1	20.0	

Surrogate	Rec. (%)	Control Limits	Qualifiers
Nitrobenzene-d5	57	28-139	
2-Fluorobiphenyl	65	33-144	
p-Terphenyl-d14	47	23-160	

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Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/22/14
Work Order: 14-07-1466
Preparation: EPA 3510C
Method: EPA 8270C SIM PAHs
Units: ug/L

Project: Red Hill LTM 112066

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-15-148-52	N/A	Aqueous	GC/MS AAA	07/28/14	07/29/14 13:03	140728L01

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Naphthalene	<0.050	0.023	0.050	0.20	1.00	U
2-Methylnaphthalene	<0.050	0.026	0.050	0.20	1.00	U
1-Methylnaphthalene	<0.050	0.028	0.050	0.20	1.00	U
Acenaphthylene	<0.050	0.018	0.050	0.20	1.00	U
Acenaphthene	<0.050	0.021	0.050	0.20	1.00	U
Fluorene	<0.050	0.024	0.050	0.20	1.00	U
Phenanthrene	<0.050	0.031	0.050	0.20	1.00	U
Anthracene	<0.050	0.034	0.050	0.20	1.00	U
Fluoranthene	<0.050	0.027	0.050	0.20	1.00	U
Pyrene	<0.050	0.025	0.050	0.20	1.00	U
Benzo (a) Anthracene	<0.050	0.024	0.050	0.20	1.00	U
Chrysene	<0.050	0.019	0.050	0.20	1.00	U
Benzo (k) Fluoranthene	<0.050	0.023	0.050	0.20	1.00	U
Benzo (b) Fluoranthene	<0.050	0.025	0.050	0.20	1.00	U
Benzo (a) Pyrene	<0.050	0.036	0.050	0.20	1.00	U
Indeno (1,2,3-c,d) Pyrene	<0.050	0.022	0.050	0.20	1.00	U
Dibenz (a,h) Anthracene	<0.050	0.027	0.050	0.20	1.00	U
Benzo (g,h,i) Perylene	<0.050	0.022	0.050	0.20	1.00	U

Surrogate	Rec. (%)	Control Limits	Qualifiers
Nitrobenzene-d5	90	28-139	
2-Fluorobiphenyl	86	33-144	
p-Terphenyl-d14	87	23-160	

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Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/22/14
Work Order: 14-07-1466
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B
Units: ug/L

Project: Red Hill LTM 112066

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES103	14-07-1466-1-A	07/21/14 08:55	Aqueous	GC/MS OO	07/22/14	07/22/14 22:46	140722L025

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Acetone	<10	6.0	10	20	1.00	U,ICH
Benzene	<0.50	0.14	0.50	1.0	1.00	U
Bromodichloromethane	<0.50	0.21	0.50	5.0	1.00	U
Bromoform	<1.0	0.50	1.0	10	1.00	U
Bromomethane	<5.0	3.9	5.0	20	1.00	U
2-Butanone	<5.0	2.2	5.0	10	1.00	U
Carbon Tetrachloride	<0.50	0.23	0.50	1.0	1.00	U
Chlorobenzene	<0.50	0.17	0.50	5.0	1.00	U
Chloroethane	<5.0	2.3	5.0	10	1.00	U
Chloroform	<0.50	0.46	0.50	5.0	1.00	U
Chloromethane	<2.0	1.8	2.0	10	1.00	U,IJ
Dibromochloromethane	<0.50	0.25	0.50	1.0	1.00	U
1,2-Dibromo-3-Chloropropane	<2.0	1.2	2.0	10	1.00	U
1,2-Dibromoethane	<0.50	0.36	0.50	1.0	1.00	U
1,2-Dichlorobenzene	<0.50	0.46	0.50	1.0	1.00	U
1,3-Dichlorobenzene	<0.50	0.40	0.50	1.0	1.00	U
1,4-Dichlorobenzene	<0.50	0.43	0.50	1.0	1.00	U
1,1-Dichloroethane	<0.50	0.28	0.50	5.0	1.00	U
1,2-Dichloroethane	<0.50	0.24	0.50	1.0	1.00	U
1,1-Dichloroethene	<0.50	0.43	0.50	1.0	1.00	U
c-1,2-Dichloroethene	<0.50	0.48	0.50	1.0	1.00	U
t-1,2-Dichloroethene	<0.50	0.37	0.50	1.0	1.00	U
1,2-Dichloropropane	<0.50	0.42	0.50	5.0	1.00	U
c-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1.00	U
t-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1.00	U
Ethylbenzene	<0.50	0.14	0.50	1.0	1.00	U
Methylene Chloride	<1.0	0.64	1.0	5.0	1.00	U
4-Methyl-2-Pentanone	<5.0	4.4	5.0	10	1.00	U
Styrene	<0.50	0.17	0.50	1.0	1.00	U
1,1,1,2-Tetrachloroethane	<0.50	0.40	0.50	1.0	1.00	U
1,1,2,2-Tetrachloroethane	<0.50	0.41	0.50	1.0	1.00	U
Tetrachloroethene	<0.50	0.39	0.50	5.0	1.00	U
Toluene	<0.50	0.24	0.50	1.0	1.00	U
1,2,4-Trichlorobenzene	<1.0	0.50	1.0	5.0	1.00	U
1,1,1-Trichloroethane	<0.50	0.30	0.50	5.0	1.00	U
Hexachloro-1,3-Butadiene	<0.50	0.32	0.50	1.0	1.00	U

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Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/22/14
Work Order: 14-07-1466
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B
Units: ug/L

Project: Red Hill LTM 112066

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<u>Parameter</u>	<u>Result</u>	<u>DL</u>	<u>LOD</u>	<u>LOQ</u>	<u>DF</u>	<u>Qualifiers</u>
1,1,2-Trichloroethane	<0.50	0.38	0.50	1.0	1.00	U
Trichloroethene	<0.50	0.37	0.50	1.0	1.00	U
1,2,3-Trichloropropane	<1.0	0.64	1.0	5.0	1.00	U
Vinyl Chloride	<0.50	0.30	0.50	1.0	1.00	U
p/m-Xylene	<1.0	0.30	1.0	10	1.00	U
o-Xylene	<0.50	0.23	0.50	1.0	1.00	U
Methyl-t-Butyl Ether (MTBE)	<0.50	0.31	0.50	1.0	1.00	U
Gasoline Range Organics	<30	26	30	50	1.00	U

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
Dibromofluoromethane	97	80-126	
1,2-Dichloroethane-d4	93	80-134	
Toluene-d8	99	80-120	
Toluene-d8-TPPH	99	88-112	
1,4-Bromofluorobenzene	94	80-120	

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Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/22/14
Work Order: 14-07-1466
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B
Units: ug/L

Project: Red Hill LTM 112066

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES104	14-07-1466-2-A	07/21/14 10:00	Aqueous	GC/MS OO	07/22/14	07/22/14 18:15	140722L025

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Acetone	<10	6.0	10	20	1.00	U,ICH
Benzene	<0.50	0.14	0.50	1.0	1.00	U
Bromodichloromethane	<0.50	0.21	0.50	5.0	1.00	U
Bromoform	<1.0	0.50	1.0	10	1.00	U
Bromomethane	<5.0	3.9	5.0	20	1.00	U
2-Butanone	<5.0	2.2	5.0	10	1.00	U
Carbon Tetrachloride	<0.50	0.23	0.50	1.0	1.00	U
Chlorobenzene	<0.50	0.17	0.50	5.0	1.00	U
Chloroethane	<5.0	2.3	5.0	10	1.00	U
Chloroform	<0.50	0.46	0.50	5.0	1.00	U
Chloromethane	<2.0	1.8	2.0	10	1.00	U,IJ
Dibromochloromethane	<0.50	0.25	0.50	1.0	1.00	U
1,2-Dibromo-3-Chloropropane	<2.0	1.2	2.0	10	1.00	U
1,2-Dibromoethane	<0.50	0.36	0.50	1.0	1.00	U
1,2-Dichlorobenzene	<0.50	0.46	0.50	1.0	1.00	U
1,3-Dichlorobenzene	<0.50	0.40	0.50	1.0	1.00	U
1,4-Dichlorobenzene	<0.50	0.43	0.50	1.0	1.00	U
1,1-Dichloroethane	<0.50	0.28	0.50	5.0	1.00	U
1,2-Dichloroethane	<0.50	0.24	0.50	1.0	1.00	U
1,1-Dichloroethene	<0.50	0.43	0.50	1.0	1.00	U
c-1,2-Dichloroethene	<0.50	0.48	0.50	1.0	1.00	U
t-1,2-Dichloroethene	<0.50	0.37	0.50	1.0	1.00	U
1,2-Dichloropropane	<0.50	0.42	0.50	5.0	1.00	U
c-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1.00	U
t-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1.00	U
Ethylbenzene	<0.50	0.14	0.50	1.0	1.00	U
Methylene Chloride	<1.0	0.64	1.0	5.0	1.00	U
4-Methyl-2-Pentanone	<5.0	4.4	5.0	10	1.00	U
Styrene	<0.50	0.17	0.50	1.0	1.00	U
1,1,1,2-Tetrachloroethane	<0.50	0.40	0.50	1.0	1.00	U
1,1,2,2-Tetrachloroethane	<0.50	0.41	0.50	1.0	1.00	U
Tetrachloroethene	<0.50	0.39	0.50	5.0	1.00	U
Toluene	<0.50	0.24	0.50	1.0	1.00	U
1,2,4-Trichlorobenzene	<1.0	0.50	1.0	5.0	1.00	U
1,1,1-Trichloroethane	<0.50	0.30	0.50	5.0	1.00	U
Hexachloro-1,3-Butadiene	<0.50	0.32	0.50	1.0	1.00	U

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Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/22/14
Work Order: 14-07-1466
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B
Units: ug/L

Project: Red Hill LTM 112066

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<u>Parameter</u>	<u>Result</u>	<u>DL</u>	<u>LOD</u>	<u>LOQ</u>	<u>DF</u>	<u>Qualifiers</u>
1,1,2-Trichloroethane	<0.50	0.38	0.50	1.0	1.00	U
Trichloroethene	<0.50	0.37	0.50	1.0	1.00	U
1,2,3-Trichloropropane	<1.0	0.64	1.0	5.0	1.00	U
Vinyl Chloride	<0.50	0.30	0.50	1.0	1.00	U
p/m-Xylene	<1.0	0.30	1.0	10	1.00	U
o-Xylene	0.36	0.23	0.50	1.0	1.00	J
Methyl-t-Butyl Ether (MTBE)	<0.50	0.31	0.50	1.0	1.00	U
Gasoline Range Organics	48	26	30	50	1.00	J

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
Dibromofluoromethane	99	80-126	
1,2-Dichloroethane-d4	93	80-134	
Toluene-d8	100	80-120	
Toluene-d8-TPPH	99	88-112	
1,4-Bromofluorobenzene	99	80-120	

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Calscience

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/22/14
Work Order: 14-07-1466
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B
Units: ug/L

Project: Red Hill LTM 112066

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES105	14-07-1466-3-A	07/21/14 10:55	Aqueous	GC/MS OO	07/22/14	07/22/14 23:13	140722L025

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Acetone	<10	6.0	10	20	1.00	U,ICH
Benzene	<0.50	0.14	0.50	1.0	1.00	U
Bromodichloromethane	<0.50	0.21	0.50	5.0	1.00	U
Bromoform	<1.0	0.50	1.0	10	1.00	U
Bromomethane	<5.0	3.9	5.0	20	1.00	U
2-Butanone	<5.0	2.2	5.0	10	1.00	U
Carbon Tetrachloride	<0.50	0.23	0.50	1.0	1.00	U
Chlorobenzene	<0.50	0.17	0.50	5.0	1.00	U
Chloroethane	<5.0	2.3	5.0	10	1.00	U
Chloroform	<0.50	0.46	0.50	5.0	1.00	U
Chloromethane	<2.0	1.8	2.0	10	1.00	U,IJ
Dibromochloromethane	<0.50	0.25	0.50	1.0	1.00	U
1,2-Dibromo-3-Chloropropane	<2.0	1.2	2.0	10	1.00	U
1,2-Dibromoethane	<0.50	0.36	0.50	1.0	1.00	U
1,2-Dichlorobenzene	<0.50	0.46	0.50	1.0	1.00	U
1,3-Dichlorobenzene	<0.50	0.40	0.50	1.0	1.00	U
1,4-Dichlorobenzene	<0.50	0.43	0.50	1.0	1.00	U
1,1-Dichloroethane	<0.50	0.28	0.50	5.0	1.00	U
1,2-Dichloroethane	<0.50	0.24	0.50	1.0	1.00	U
1,1-Dichloroethene	<0.50	0.43	0.50	1.0	1.00	U
c-1,2-Dichloroethene	<0.50	0.48	0.50	1.0	1.00	U
t-1,2-Dichloroethene	<0.50	0.37	0.50	1.0	1.00	U
1,2-Dichloropropane	<0.50	0.42	0.50	5.0	1.00	U
c-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1.00	U
t-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1.00	U
Ethylbenzene	<0.50	0.14	0.50	1.0	1.00	U
Methylene Chloride	<1.0	0.64	1.0	5.0	1.00	U
4-Methyl-2-Pentanone	<5.0	4.4	5.0	10	1.00	U
Styrene	<0.50	0.17	0.50	1.0	1.00	U
1,1,1,2-Tetrachloroethane	<0.50	0.40	0.50	1.0	1.00	U
1,1,2,2-Tetrachloroethane	<0.50	0.41	0.50	1.0	1.00	U
Tetrachloroethene	<0.50	0.39	0.50	5.0	1.00	U
Toluene	<0.50	0.24	0.50	1.0	1.00	U
1,2,4-Trichlorobenzene	<1.0	0.50	1.0	5.0	1.00	U
1,1,1-Trichloroethane	<0.50	0.30	0.50	5.0	1.00	U
Hexachloro-1,3-Butadiene	<0.50	0.32	0.50	1.0	1.00	U

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Calscience

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/22/14
Work Order: 14-07-1466
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B
Units: ug/L

Project: Red Hill LTM 112066

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<u>Parameter</u>	<u>Result</u>	<u>DL</u>	<u>LOD</u>	<u>LOQ</u>	<u>DF</u>	<u>Qualifiers</u>
1,1,2-Trichloroethane	<0.50	0.38	0.50	1.0	1.00	U
Trichloroethene	<0.50	0.37	0.50	1.0	1.00	U
1,2,3-Trichloropropane	<1.0	0.64	1.0	5.0	1.00	U
Vinyl Chloride	<0.50	0.30	0.50	1.0	1.00	U
p/m-Xylene	<1.0	0.30	1.0	10	1.00	U
o-Xylene	0.33	0.23	0.50	1.0	1.00	J
Methyl-t-Butyl Ether (MTBE)	<0.50	0.31	0.50	1.0	1.00	U
Gasoline Range Organics	49	26	30	50	1.00	J

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
Dibromofluoromethane	99	80-126	
1,2-Dichloroethane-d4	93	80-134	
Toluene-d8	99	80-120	
Toluene-d8-TPPH	98	88-112	
1,4-Bromofluorobenzene	96	80-120	

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Calscience

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/22/14
Work Order: 14-07-1466
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B
Units: ug/L

Project: Red Hill LTM 112066

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES TRIP	14-07-1466-4-A	07/21/14 08:00	Aqueous	GC/MS OO	07/22/14	07/22/14 17:48	140722L025

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Acetone	6.5	6.0	10	20	1.00	J,ICH
Benzene	<0.50	0.14	0.50	1.0	1.00	U
Bromodichloromethane	<0.50	0.21	0.50	5.0	1.00	U
Bromoform	<1.0	0.50	1.0	10	1.00	U
Bromomethane	<5.0	3.9	5.0	20	1.00	U
2-Butanone	<5.0	2.2	5.0	10	1.00	U
Carbon Tetrachloride	<0.50	0.23	0.50	1.0	1.00	U
Chlorobenzene	<0.50	0.17	0.50	5.0	1.00	U
Chloroethane	<5.0	2.3	5.0	10	1.00	U
Chloroform	<0.50	0.46	0.50	5.0	1.00	U
Chloromethane	<2.0	1.8	2.0	10	1.00	U,IJ
Dibromochloromethane	<0.50	0.25	0.50	1.0	1.00	U
1,2-Dibromo-3-Chloropropane	<2.0	1.2	2.0	10	1.00	U
1,2-Dibromoethane	<0.50	0.36	0.50	1.0	1.00	U
1,2-Dichlorobenzene	<0.50	0.46	0.50	1.0	1.00	U
1,3-Dichlorobenzene	<0.50	0.40	0.50	1.0	1.00	U
1,4-Dichlorobenzene	<0.50	0.43	0.50	1.0	1.00	U
1,1-Dichloroethane	<0.50	0.28	0.50	5.0	1.00	U
1,2-Dichloroethane	<0.50	0.24	0.50	1.0	1.00	U
1,1-Dichloroethene	<0.50	0.43	0.50	1.0	1.00	U
c-1,2-Dichloroethene	<0.50	0.48	0.50	1.0	1.00	U
t-1,2-Dichloroethene	<0.50	0.37	0.50	1.0	1.00	U
1,2-Dichloropropane	<0.50	0.42	0.50	5.0	1.00	U
c-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1.00	U
t-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1.00	U
Ethylbenzene	<0.50	0.14	0.50	1.0	1.00	U
Methylene Chloride	<1.0	0.64	1.0	5.0	1.00	U
4-Methyl-2-Pentanone	<5.0	4.4	5.0	10	1.00	U
Styrene	<0.50	0.17	0.50	1.0	1.00	U
1,1,1,2-Tetrachloroethane	<0.50	0.40	0.50	1.0	1.00	U
1,1,2,2-Tetrachloroethane	<0.50	0.41	0.50	1.0	1.00	U
Tetrachloroethene	<0.50	0.39	0.50	5.0	1.00	U
Toluene	<0.50	0.24	0.50	1.0	1.00	U
1,2,4-Trichlorobenzene	<1.0	0.50	1.0	5.0	1.00	U
1,1,1-Trichloroethane	<0.50	0.30	0.50	5.0	1.00	U
Hexachloro-1,3-Butadiene	<0.50	0.32	0.50	1.0	1.00	U

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Calscience

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/22/14
Work Order: 14-07-1466
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B
Units: ug/L

Project: Red Hill LTM 112066

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<u>Parameter</u>	<u>Result</u>	<u>DL</u>	<u>LOD</u>	<u>LOQ</u>	<u>DF</u>	<u>Qualifiers</u>
1,1,2-Trichloroethane	<0.50	0.38	0.50	1.0	1.00	U
Trichloroethene	<0.50	0.37	0.50	1.0	1.00	U
1,2,3-Trichloropropane	<1.0	0.64	1.0	5.0	1.00	U
Vinyl Chloride	<0.50	0.30	0.50	1.0	1.00	U
p/m-Xylene	<1.0	0.30	1.0	10	1.00	U
o-Xylene	<0.50	0.23	0.50	1.0	1.00	U
Methyl-t-Butyl Ether (MTBE)	<0.50	0.31	0.50	1.0	1.00	U
Gasoline Range Organics	<30	26	30	50	1.00	U

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
Dibromofluoromethane	99	80-126	
1,2-Dichloroethane-d4	92	80-134	
Toluene-d8	99	80-120	
Toluene-d8-TPPH	99	88-112	
1,4-Bromofluorobenzene	95	80-120	

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Calscience

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/22/14
Work Order: 14-07-1466
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B
Units: ug/L

Project: Red Hill LTM 112066

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-13-057-57	N/A	Aqueous	GC/MS OO	07/22/14	07/22/14 17:12	140722L025

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Acetone	<10	6.0	10	20	1.00	U
Benzene	<0.50	0.14	0.50	1.0	1.00	U
Bromodichloromethane	<0.50	0.21	0.50	5.0	1.00	U
Bromoform	<1.0	0.50	1.0	10	1.00	U
Bromomethane	<5.0	3.9	5.0	20	1.00	U
2-Butanone	<5.0	2.2	5.0	10	1.00	U
Carbon Tetrachloride	<0.50	0.23	0.50	1.0	1.00	U
Chlorobenzene	<0.50	0.17	0.50	5.0	1.00	U
Chloroethane	<5.0	2.3	5.0	10	1.00	U
Chloroform	<0.50	0.46	0.50	5.0	1.00	U
Chloromethane	<2.0	1.8	2.0	10	1.00	U
Dibromochloromethane	<0.50	0.25	0.50	1.0	1.00	U
1,2-Dibromo-3-Chloropropane	<2.0	1.2	2.0	10	1.00	U
1,2-Dibromoethane	<0.50	0.36	0.50	1.0	1.00	U
1,2-Dichlorobenzene	<0.50	0.46	0.50	1.0	1.00	U
1,3-Dichlorobenzene	<0.50	0.40	0.50	1.0	1.00	U
1,4-Dichlorobenzene	<0.50	0.43	0.50	1.0	1.00	U
1,1-Dichloroethane	<0.50	0.28	0.50	5.0	1.00	U
1,2-Dichloroethane	<0.50	0.24	0.50	1.0	1.00	U
1,1-Dichloroethene	<0.50	0.43	0.50	1.0	1.00	U
c-1,2-Dichloroethene	<0.50	0.48	0.50	1.0	1.00	U
t-1,2-Dichloroethene	<0.50	0.37	0.50	1.0	1.00	U
1,2-Dichloropropane	<0.50	0.42	0.50	5.0	1.00	U
c-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1.00	U
t-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1.00	U
Ethylbenzene	<0.50	0.14	0.50	1.0	1.00	U
Methylene Chloride	<1.0	0.64	1.0	5.0	1.00	U
4-Methyl-2-Pentanone	<5.0	4.4	5.0	10	1.00	U
Styrene	<0.50	0.17	0.50	1.0	1.00	U
1,1,1,2-Tetrachloroethane	<0.50	0.40	0.50	1.0	1.00	U
1,1,2,2-Tetrachloroethane	<0.50	0.41	0.50	1.0	1.00	U
Tetrachloroethene	<0.50	0.39	0.50	5.0	1.00	U
Toluene	<0.50	0.24	0.50	1.0	1.00	U
1,2,4-Trichlorobenzene	<1.0	0.50	1.0	5.0	1.00	U
1,1,1-Trichloroethane	<0.50	0.30	0.50	5.0	1.00	U
Hexachloro-1,3-Butadiene	<0.50	0.32	0.50	1.0	1.00	U

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Calscience

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/22/14
Work Order: 14-07-1466
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B
Units: ug/L

Project: Red Hill LTM 112066

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<u>Parameter</u>	<u>Result</u>	<u>DL</u>	<u>LOD</u>	<u>LOQ</u>	<u>DF</u>	<u>Qualifiers</u>
1,1,2-Trichloroethane	<0.50	0.38	0.50	1.0	1.00	U
Trichloroethene	<0.50	0.37	0.50	1.0	1.00	U
1,2,3-Trichloropropane	<1.0	0.64	1.0	5.0	1.00	U
Vinyl Chloride	<0.50	0.30	0.50	1.0	1.00	U
p/m-Xylene	<1.0	0.30	1.0	10	1.00	U
o-Xylene	<0.50	0.23	0.50	1.0	1.00	U
Methyl-t-Butyl Ether (MTBE)	<0.50	0.31	0.50	1.0	1.00	U
Gasoline Range Organics	<30	26	30	50	1.00	U

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
Dibromofluoromethane	98	80-126	
1,2-Dichloroethane-d4	92	80-134	
Toluene-d8	99	80-120	
Toluene-d8-TPPH	98	88-112	
1,4-Bromofluorobenzene	95	80-120	

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Calscience

Quality Control - Spike/Spike Duplicate

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/22/14
Work Order: 14-07-1466
Preparation: EPA 3510C
Method: EPA 8015B (M)

Project: Red Hill LTM 112066

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
ES104	Sample	Aqueous	GC 45	07/23/14	07/24/14 21:30	140723S11A
ES104	Matrix Spike	Aqueous	GC 45	07/23/14	07/24/14 20:17	140723S11A
ES104	Matrix Spike Duplicate	Aqueous	GC 45	07/23/14	07/24/14 20:36	140723S11A

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
TPH as Diesel	1182	2000	3130	97	3204	101	55-133	2	0-30	

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RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - Spike/Spike Duplicate

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/22/14
Work Order: 14-07-1466
Preparation: EPA 3005A Filt.
Method: EPA 6020

Project: Red Hill LTM 112066

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
ES104	Sample	Aqueous	ICP/MS 04	07/23/14	07/24/14 19:48	140723S03
ES104	Matrix Spike	Aqueous	ICP/MS 04	07/23/14	07/24/14 19:39	140723S03
ES104	Matrix Spike Duplicate	Aqueous	ICP/MS 04	07/23/14	07/24/14 19:41	140723S03

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Lead	ND	0.1000	0.1059	106	0.1128	113	80-120	6	0-20	

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RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - Spike/Spike Duplicate

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/22/14
Work Order: 14-07-1466
Preparation: EPA 3510C
Method: EPA 8270C SIM PAHs

Project: Red Hill LTM 112066

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number				
ES104	Sample	Aqueous	GC/MS AAA	07/28/14	07/29/14 21:31	140728S01				
ES104	Matrix Spike	Aqueous	GC/MS AAA	07/28/14	07/29/14 13:52	140728S01				
ES104	Matrix Spike Duplicate	Aqueous	GC/MS AAA	07/28/14	07/29/14 14:16	140728S01				
Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Naphthalene	70.83	2.000	59.97	0	64.80	0	21-133	8	0-25	3
2-Methylnaphthalene	19.64	2.000	21.30	83	18.58	0	21-140	14	0-25	3
1-Methylnaphthalene	25.19	2.000	25.26	4	24.73	0	20-140	2	0-25	3
Acenaphthylene	ND	2.000	1.370	68	1.495	75	33-145	9	0-25	
Acenaphthene	0.5154	2.000	1.776	63	1.936	71	49-121	9	0-25	
Fluorene	0.2363	2.000	1.536	65	1.689	73	59-121	10	0-25	
Phenanthrene	ND	2.000	1.313	66	1.517	76	54-120	14	0-25	
Anthracene	ND	2.000	1.421	71	1.551	78	27-133	9	0-25	
Fluoranthene	ND	2.000	1.282	64	1.431	72	26-137	11	0-25	
Pyrene	ND	2.000	1.192	60	1.344	67	18-168	12	0-25	
Benzo (a) Anthracene	ND	2.000	1.252	63	1.416	71	33-143	12	0-25	
Chrysene	ND	2.000	1.298	65	1.459	73	17-168	12	0-25	
Benzo (k) Fluoranthene	ND	2.000	1.137	57	1.284	64	24-159	12	0-25	
Benzo (b) Fluoranthene	ND	2.000	1.117	56	1.282	64	24-159	14	0-25	
Benzo (a) Pyrene	ND	2.000	1.181	59	1.348	67	17-163	13	0-25	
Indeno (1,2,3-c,d) Pyrene	ND	2.000	1.190	60	1.329	66	10-171	11	0-25	
Dibenz (a,h) Anthracene	ND	2.000	1.195	60	1.342	67	10-219	12	0-25	
Benzo (g,h,i) Perylene	ND	2.000	1.252	63	1.389	69	10-227	10	0-25	

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RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - Spike/Spike Duplicate

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/22/14
Work Order: 14-07-1466
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B

Project: Red Hill LTM 112066

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Quality Control Sample ID	Type		Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number			
ES104	Sample		Aqueous	GC/MS OO	07/22/14	07/22/14 18:15	140722S011			
ES104	Matrix Spike		Aqueous	GC/MS OO	07/22/14	07/22/14 18:42	140722S011			
ES104	Matrix Spike Duplicate		Aqueous	GC/MS OO	07/22/14	07/22/14 19:10	140722S011			
Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Acetone	ND	50.00	68.38	137	67.89	136	40-140	1	0-20	
Benzene	ND	50.00	48.75	97	47.76	96	80-120	2	0-20	
Bromobenzene	ND	50.00	49.17	98	49.04	98	75-125	0	0-20	
Bromochloromethane	ND	50.00	51.02	102	50.51	101	65-135	1	0-20	
Bromodichloromethane	ND	50.00	50.05	100	48.80	98	75-120	3	0-20	
Bromoform	ND	50.00	49.04	98	47.81	96	70-130	3	0-20	
Bromomethane	ND	50.00	45.28	91	41.18	82	30-145	9	0-20	
2-Butanone	ND	50.00	51.87	104	50.83	102	30-150	2	0-20	
n-Butylbenzene	3.292	50.00	55.43	104	54.21	102	70-135	2	0-20	
sec-Butylbenzene	3.056	50.00	56.01	106	54.93	104	70-125	2	0-20	
tert-Butylbenzene	ND	50.00	53.19	106	52.66	105	70-130	1	0-20	
Carbon Disulfide	ND	50.00	37.91	76	37.81	76	35-160	0	0-20	
Carbon Tetrachloride	ND	50.00	46.80	94	46.16	92	65-140	1	0-20	
Chlorobenzene	ND	50.00	50.45	101	50.22	100	80-120	0	0-20	
Chloroethane	ND	50.00	42.16	84	42.32	85	60-135	0	0-20	
Chloroform	ND	50.00	47.60	95	47.54	95	65-135	0	0-20	
Chloromethane	ND	50.00	38.39	77	39.39	79	40-125	3	0-20	
2-Chlorotoluene	ND	50.00	51.15	102	50.66	101	75-125	1	0-20	
4-Chlorotoluene	ND	50.00	50.34	101	48.92	98	75-130	3	0-20	
Dibromochloromethane	ND	50.00	51.29	103	50.73	101	60-135	1	0-20	
1,2-Dibromo-3-Chloropropane	ND	50.00	44.35	89	44.28	89	50-130	0	0-20	
1,2-Dibromoethane	ND	50.00	48.68	97	48.61	97	80-120	0	0-20	
Dibromomethane	ND	50.00	50.83	102	50.24	100	75-125	1	0-20	
1,2-Dichlorobenzene	ND	50.00	50.78	102	50.20	100	70-120	1	0-20	
1,3-Dichlorobenzene	ND	50.00	51.20	102	50.63	101	75-125	1	0-20	
1,4-Dichlorobenzene	ND	50.00	49.14	98	48.08	96	75-125	2	0-20	
Dichlorodifluoromethane	ND	50.00	52.63	105	51.58	103	30-155	2	0-20	
1,1-Dichloroethane	ND	50.00	47.19	94	47.06	94	70-135	0	0-20	
1,2-Dichloroethane	ND	50.00	45.56	91	45.19	90	70-130	1	0-20	
1,1-Dichloroethene	ND	50.00	47.66	95	46.67	93	70-130	2	0-20	
c-1,2-Dichloroethene	ND	50.00	52.88	106	52.56	105	70-125	1	0-20	
t-1,2-Dichloroethene	ND	50.00	51.07	102	50.78	102	60-140	1	0-20	
1,2-Dichloropropane	ND	50.00	49.03	98	49.83	100	75-125	2	0-20	
1,3-Dichloropropane	ND	50.00	47.89	96	47.75	95	75-125	0	0-20	
2,2-Dichloropropane	ND	50.00	45.57	91	46.00	92	70-135	1	0-20	

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - Spike/Spike Duplicate

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/22/14
Work Order: 14-07-1466
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B

Project: Red Hill LTM 112066

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Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
1,1-Dichloropropene	ND	50.00	47.94	96	48.39	97	75-130	1	0-20	
c-1,3-Dichloropropene	ND	50.00	52.46	105	52.70	105	70-130	0	0-20	
t-1,3-Dichloropropene	ND	50.00	51.27	103	51.49	103	55-140	0	0-20	
Ethylbenzene	ND	50.00	49.73	99	49.35	99	75-125	1	0-20	
2-Hexanone	ND	50.00	51.36	103	50.46	101	55-130	2	0-20	
Isopropylbenzene	ND	50.00	54.76	110	54.15	108	75-125	1	0-20	
p-Isopropyltoluene	ND	50.00	47.57	95	46.54	93	75-130	2	0-20	
Methylene Chloride	ND	50.00	50.87	102	50.51	101	55-140	1	0-20	
4-Methyl-2-Pentanone	ND	50.00	48.77	98	49.75	100	60-135	2	0-20	
Naphthalene	63.90	50.00	115.2	103	113.4	99	55-140	2	0-20	
n-Propylbenzene	4.683	50.00	56.47	104	55.41	101	70-130	2	0-20	
Styrene	ND	50.00	51.33	103	50.88	102	65-135	1	0-20	
1,1,1,2-Tetrachloroethane	ND	50.00	48.71	97	48.14	96	80-130	1	0-20	
1,1,2,2-Tetrachloroethane	ND	50.00	51.97	104	51.20	102	65-130	1	0-20	
Tetrachloroethene	ND	50.00	43.72	87	42.36	85	45-150	3	0-20	
Toluene	ND	50.00	48.84	98	47.83	96	75-120	2	0-20	
1,2,3-Trichlorobenzene	ND	50.00	50.43	101	50.15	100	55-140	1	0-20	
1,2,4-Trichlorobenzene	ND	50.00	50.65	101	49.25	99	65-135	3	0-20	
1,1,1-Trichloroethane	ND	50.00	46.97	94	46.67	93	65-130	1	0-20	
Hexachloro-1,3-Butadiene	ND	50.00	46.84	94	45.73	91	50-140	2	0-20	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	50.00	45.86	92	44.56	89	80-130	3	0-20	
1,1,2-Trichloroethane	ND	50.00	50.20	100	49.27	99	75-125	2	0-20	
Trichloroethene	ND	50.00	48.36	97	46.73	93	70-125	3	0-20	
Trichlorofluoromethane	ND	50.00	48.95	98	47.58	95	60-145	3	0-20	
1,2,3-Trichloropropane	ND	50.00	46.90	94	47.05	94	75-125	0	0-20	
1,2,4-Trimethylbenzene	ND	50.00	51.25	103	50.42	101	75-130	2	0-20	
1,3,5-Trimethylbenzene	ND	50.00	51.97	104	51.17	102	75-130	2	0-20	
Vinyl Acetate	ND	50.00	58.38	117	57.09	114	80-120	2	0-20	
Vinyl Chloride	ND	50.00	42.41	85	41.82	84	50-145	1	0-20	
p/m-Xylene	ND	100.0	98.61	99	97.67	98	75-130	1	0-20	
o-Xylene	ND	50.00	52.60	105	51.94	104	80-120	1	0-20	
Methyl-t-Butyl Ether (MTBE)	ND	50.00	47.14	94	47.64	95	65-125	1	0-20	
Tert-Butyl Alcohol (TBA)	ND	250.0	236.1	94	230.4	92	46-154	2	0-35	
Diisopropyl Ether (DIPE)	ND	50.00	49.90	100	50.26	101	81-123	1	0-20	
Ethyl-t-Butyl Ether (ETBE)	ND	50.00	50.25	100	50.91	102	74-122	1	0-20	
Tert-Amyl-Methyl Ether (TAME)	ND	50.00	49.17	98	49.83	100	76-124	1	0-20	
Ethanol	ND	500.0	514.2	103	520.6	104	60-138	1	0-35	

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - PDS

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/22/14
Work Order: 14-07-1466
Preparation: EPA 3005A Filt.
Method: EPA 6020

Project: Red Hill LTM 112066

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	PDS/PDSD Batch Number	
ES104	Sample	Aqueous	ICP/MS 04	07/23/14 00:00	07/24/14 19:48	140723S03	
ES104	PDS	Aqueous	ICP/MS 04	07/23/14 00:00	07/24/14 19:43	140723S03	
<u>Parameter</u>		<u>Sample Conc.</u>	<u>Spike Added</u>	<u>PDS Conc.</u>	<u>PDS %Rec.</u>	<u>%Rec. CL</u>	<u>Qualifiers</u>
Lead		ND	0.1000	0.1023	102	75-125	

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS/LCSD

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/22/14
Work Order: 14-07-1466
Preparation: EPA 3510C
Method: EPA 8015B (M)

Project: Red Hill LTM 112066

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number			
099-15-516-158	LCS	Aqueous	GC 45	07/23/14	07/24/14 18:30	140723B11A			
099-15-516-158	LCSD	Aqueous	GC 45	07/23/14	07/24/14 18:48	140723B11A			
Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
TPH as Diesel	2000	2031	102	2018	101	60-132	1	0-11	

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RPD: Relative Percent Difference. CL: Control Limits



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Quality Control - LCS

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/22/14
Work Order: 14-07-1466
Preparation: EPA 3005A Filt.
Method: EPA 6020

Project: Red Hill LTM 112066

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-14-497-87	LCS	Aqueous	ICP/MS 04	07/23/14	07/24/14 19:32	140723L03D

<u>Parameter</u>	<u>Spike Added</u>	<u>Conc. Recovered</u>	<u>LCS %Rec.</u>	<u>%Rec. CL</u>	<u>Qualifiers</u>
Lead	0.1000	0.09175	92	80-120	

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Quality Control - LCS

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/22/14
Work Order: 14-07-1466
Preparation: EPA 3510C
Method: EPA 8270C SIM PAHs

Project: Red Hill LTM 112066

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-15-148-52	LCS	Aqueous	GC/MS AAA	07/28/14	07/29/14 13:28	140728L01
Parameter		Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	Qualifiers
Naphthalene		2.000	1.361	68	21-133	
2-Methylnaphthalene		2.000	1.230	61	21-140	
1-Methylnaphthalene		2.000	1.226	61	20-140	
Acenaphthylene		2.000	1.167	58	33-145	
Acenaphthene		2.000	1.271	64	55-121	
Fluorene		2.000	1.315	66	59-121	
Phenanthrene		2.000	1.379	69	54-120	
Anthracene		2.000	1.393	70	27-133	
Fluoranthene		2.000	1.385	69	26-137	
Pyrene		2.000	1.333	67	45-129	
Benzo (a) Anthracene		2.000	1.343	67	33-143	
Chrysene		2.000	1.447	72	17-168	
Benzo (k) Fluoranthene		2.000	1.265	63	24-159	
Benzo (b) Fluoranthene		2.000	1.294	65	24-159	
Benzo (a) Pyrene		2.000	1.273	64	17-163	
Indeno (1,2,3-c,d) Pyrene		2.000	1.408	70	25-175	
Dibenz (a,h) Anthracene		2.000	1.350	67	25-175	
Benzo (g,h,i) Perylene		2.000	1.500	75	25-157	



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Quality Control - LCS/LCSD

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/22/14
Work Order: 14-07-1466
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B

Project: Red Hill LTM 112066

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-13-057-57	LCS	Aqueous	GC/MS OO	07/22/14	07/22/14 15:40	140722L025
099-13-057-57	LCSD	Aqueous	GC/MS OO	07/22/14	07/22/14 16:07	140722L025

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Acetone	50.00	88.82	178	N/A	N/A	40-140	N/A	0-20	X
Benzene	50.00	49.88	100	N/A	N/A	80-120	N/A	0-20	
Bromobenzene	50.00	49.40	99	N/A	N/A	75-125	N/A	0-20	
Bromochloromethane	50.00	50.20	100	N/A	N/A	65-130	N/A	0-20	
Bromodichloromethane	50.00	49.69	99	N/A	N/A	75-120	N/A	0-20	
Bromoform	50.00	50.09	100	N/A	N/A	70-130	N/A	0-20	
Bromomethane	50.00	41.76	84	N/A	N/A	30-145	N/A	0-20	
2-Butanone	50.00	64.52	129	N/A	N/A	30-150	N/A	0-20	
n-Butylbenzene	50.00	54.15	108	N/A	N/A	70-135	N/A	0-20	
sec-Butylbenzene	50.00	55.17	110	N/A	N/A	70-125	N/A	0-20	
tert-Butylbenzene	50.00	54.15	108	N/A	N/A	70-130	N/A	0-20	
Carbon Disulfide	50.00	40.26	81	N/A	N/A	35-160	N/A	0-20	
Carbon Tetrachloride	50.00	49.66	99	N/A	N/A	65-140	N/A	0-20	
Chlorobenzene	50.00	51.79	104	N/A	N/A	80-120	N/A	0-20	
Chloroethane	50.00	42.88	86	N/A	N/A	60-135	N/A	0-20	
Chloroform	50.00	48.16	96	N/A	N/A	65-135	N/A	0-20	
Chloromethane	50.00	39.99	80	N/A	N/A	40-125	N/A	0-20	
2-Chlorotoluene	50.00	51.99	104	N/A	N/A	75-125	N/A	0-20	
4-Chlorotoluene	50.00	51.09	102	N/A	N/A	75-130	N/A	0-20	
Dibromochloromethane	50.00	50.95	102	N/A	N/A	60-135	N/A	0-20	
1,2-Dibromo-3-Chloropropane	50.00	47.49	95	N/A	N/A	50-130	N/A	0-20	
1,2-Dibromoethane	50.00	48.66	97	N/A	N/A	80-120	N/A	0-20	
Dibromomethane	50.00	50.64	101	N/A	N/A	75-125	N/A	0-20	
1,2-Dichlorobenzene	50.00	51.35	103	N/A	N/A	70-120	N/A	0-20	
1,3-Dichlorobenzene	50.00	52.64	105	N/A	N/A	75-125	N/A	0-20	
1,4-Dichlorobenzene	50.00	49.60	99	N/A	N/A	75-125	N/A	0-20	
Dichlorodifluoromethane	50.00	55.16	110	N/A	N/A	30-155	N/A	0-20	
1,1-Dichloroethane	50.00	48.68	97	N/A	N/A	70-135	N/A	0-20	
1,2-Dichloroethane	50.00	45.73	91	N/A	N/A	70-130	N/A	0-20	
1,1-Dichloroethene	50.00	50.18	100	N/A	N/A	70-130	N/A	0-20	
c-1,2-Dichloroethene	50.00	54.08	108	N/A	N/A	70-125	N/A	0-20	
t-1,2-Dichloroethene	50.00	52.36	105	N/A	N/A	60-140	N/A	0-20	
1,2-Dichloropropane	50.00	49.64	99	N/A	N/A	75-125	N/A	0-20	
1,3-Dichloropropane	50.00	47.76	96	N/A	N/A	75-125	N/A	0-20	
2,2-Dichloropropane	50.00	49.18	98	N/A	N/A	70-135	N/A	0-20	
1,1-Dichloropropene	50.00	50.36	101	N/A	N/A	75-130	N/A	0-20	

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS/LCSD

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/22/14
Work Order: 14-07-1466
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B

Project: Red Hill LTM 112066

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Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
c-1,3-Dichloropropene	50.00	53.61	107	N/A	N/A	70-130	N/A	0-20	
t-1,3-Dichloropropene	50.00	53.53	107	N/A	N/A	55-140	N/A	0-20	
Ethylbenzene	50.00	51.23	102	N/A	N/A	75-125	N/A	0-20	
2-Hexanone	50.00	57.37	115	N/A	N/A	55-130	N/A	0-20	
Isopropylbenzene	50.00	53.77	108	N/A	N/A	75-125	N/A	0-20	
p-Isopropyltoluene	50.00	49.20	98	N/A	N/A	75-130	N/A	0-20	
Methylene Chloride	50.00	51.33	103	N/A	N/A	55-140	N/A	0-20	
4-Methyl-2-Pentanone	50.00	53.25	107	N/A	N/A	60-135	N/A	0-20	
Naphthalene	50.00	50.18	100	N/A	N/A	55-140	N/A	0-20	
n-Propylbenzene	50.00	53.12	106	N/A	N/A	70-130	N/A	0-20	
Styrene	50.00	52.08	104	N/A	N/A	65-135	N/A	0-20	
1,1,1,2-Tetrachloroethane	50.00	48.97	98	N/A	N/A	80-130	N/A	0-20	
1,1,2,2-Tetrachloroethane	50.00	50.50	101	N/A	N/A	65-130	N/A	0-20	
Tetrachloroethene	50.00	51.35	103	N/A	N/A	45-150	N/A	0-20	
Toluene	50.00	49.99	100	N/A	N/A	75-120	N/A	0-20	
1,2,3-Trichlorobenzene	50.00	50.65	101	N/A	N/A	55-140	N/A	0-20	
1,2,4-Trichlorobenzene	50.00	50.31	101	N/A	N/A	65-135	N/A	0-20	
1,1,1-Trichloroethane	50.00	48.83	98	N/A	N/A	65-130	N/A	0-20	
Hexachloro-1,3-Butadiene	50.00	48.70	97	N/A	N/A	50-140	N/A	0-20	
1,1,2-Trichloro-1,2,2-Trifluoroethane	50.00	48.22	96	N/A	N/A	80-130	N/A	0-20	
1,1,2-Trichloroethane	50.00	49.34	99	N/A	N/A	75-125	N/A	0-20	
Trichloroethene	50.00	51.40	103	N/A	N/A	70-125	N/A	0-20	
Trichlorofluoromethane	50.00	50.79	102	N/A	N/A	60-145	N/A	0-20	
1,2,3-Trichloropropane	50.00	48.87	98	N/A	N/A	75-125	N/A	0-20	
1,2,4-Trimethylbenzene	50.00	52.46	105	N/A	N/A	75-130	N/A	0-20	
1,3,5-Trimethylbenzene	50.00	52.49	105	N/A	N/A	75-130	N/A	0-20	
Vinyl Acetate	50.00	56.14	112	N/A	N/A	80-120	N/A	0-20	
Vinyl Chloride	50.00	43.53	87	N/A	N/A	50-145	N/A	0-20	
p/m-Xylene	100.0	101.3	101	N/A	N/A	75-130	N/A	0-20	
o-Xylene	50.00	53.13	106	N/A	N/A	80-120	N/A	0-20	
Methyl-t-Butyl Ether (MTBE)	50.00	47.94	96	N/A	N/A	65-125	N/A	0-20	
Tert-Butyl Alcohol (TBA)	250.0	229.7	92	N/A	N/A	46-154	N/A	0-25	
Diisopropyl Ether (DIPE)	50.00	49.67	99	N/A	N/A	81-123	N/A	0-20	
Ethyl-t-Butyl Ether (ETBE)	50.00	50.76	102	N/A	N/A	74-122	N/A	0-20	
Tert-Amyl-Methyl Ether (TAME)	50.00	49.96	100	N/A	N/A	76-124	N/A	0-20	
Ethanol	500.0	497.8	100	N/A	N/A	60-138	N/A	0-25	
Gasoline Range Organics	1000	1036	104	1019	102	80-120	2	0-20	

RPD: Relative Percent Difference. CL: Control Limits

Sample Analysis Summary Report

Work Order: 14-07-1466

Page 1 of 1

<u>Method</u>	<u>Extraction</u>	<u>Chemist ID</u>	<u>Instrument</u>	<u>Analytical Location</u>
EPA 6020	EPA 3005A Filt.	598	ICP/MS 04	1
EPA 8015B (M)	EPA 3510C	628	GC 45	1
EPA 8270C SIM PAHs	EPA 3510C	923	GC/MS AAA	1
GC/MS / EPA 8260B	EPA 5030C	849	GC/MS OO	2


Return to Contents

Location 1: 7440 Lincoln Way, Garden Grove, CA 92841

Location 2: 7445 Lampson Avenue, Garden Grove, CA 92841

Glossary of Terms and Qualifiers

Work Order: 14-07-1466

Page 1 of 1

Qualifiers	Definition
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to suspected matrix interference. The associated LCS recovery was in control.
4	The MS/MSD RPD was out of control due to suspected matrix interference.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to suspected matrix interference.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
B	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
DL	The Detection Limit (DL) is the smallest analyte concentration that can be demonstrated to be different from zero or a blank concentration at the 99% level of confidence.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
ICH	Initial calibration verification recovery is above the control limit for this analyte.
ICJ	Initial calibration verification recovery is below the control limit for this analyte.
IH	Calibration verification recovery is above the control limit for this analyte.
IJ	Calibration verification recovery is below the control limit for this analyte.
J	Analyte was detected at a concentration below the LOQ and above the DL. Reported value is estimated.
JA	Analyte positively identified but quantitation is an estimate.
LOD	The Limit of Detection (LOD) is the smallest amount or concentration of a substance that must be present in a sample in order to be detected at 99% confidence level.
LOQ	The Limit of Quantitation (LOQ) is the lowest concentration of a substance that produces a quantitative result within specified limits of precision and bias.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
U	Undetected at Detection Limit (DL) and is reported as less than the Limit of Detection (LOD).
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.
	Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.
	Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of ≤ 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.
	A calculated total result (Example: Total Pesticides) is the summation of each component concentration and/or, if "J" flags are reported, estimated concentration. Component concentrations showing not detected (ND) are summed into the calculated total result as zero concentrations.

Richard Villafania

1466

From: Ann Dang [ADang@esciencei.com]
Sent: Monday, July 21, 2014 6:14 PM
To: Richard Villafania
Cc: Domonkos Feher; Traci Sylva; Jeff Hattemer
Subject: 112066 Red Hill shipment 7/21/14
Attachments: COC 7-21-14.pdf

Hi Richard,

We shipped 2 coolers today, which you should receive tomorrow. The Fedex tracking is 804557917456 and 780042307911.

On the COC, the method VOCs (8260) should be marked. Corrections were made on the attached COC.

Thanks,
Ann

Click [here](#) to report this email as spam.

WO # / LAB USE ONLY
14-07-1466

Date 7/22/14
 Page 1 of 1

LABORATORY CLIENT: **Environmental Science International**
 ADDRESS: **304 Ulunui St., Suite 304**
 CITY: **Kailua** STATE: **HI** ZIP: **96734**

TEL: **808-261-0740** E-MAIL: **rchong@esciencel.com**
 TURNAROUND TIME (Rush surcharges may apply to any TAT not "STANDARD"):
☐ SAME DAY ☐ 24 HR ☐ 48 HR ☐ 72 HR ☒ STANDARD

☐ COELT EDF ☐ GLOBAL ID

LOG CODE

SPECIAL INSTRUCTIONS:

Regular (full) GW monitoring analyte list

LAB USE ONLY	SAMPLE ID	SAMPLING		MATRIX	NO. OF CONT.	LOG CODE			Field Filtered	X TPH(g) (8260)	X TPH(d) (8260)	TPH C6-C36 C6-C44	TPH	BTEX / MTBE 8260	VOCs (8260)	Oxygenates (8260)	Prep (5035) En Core Terra Core	SVOCs (8270)	Pesticides (8081)	PCBs (8082)	PAHs 8270 SIM	T22 Metals 6010/747X 6020/747X	Cr(VI) 7196 7199 218.6
		DATE	TIME			Unpreserved	Preserved	Field Filtered															
1	ES103	7/21/14	0855	GW	10		X	X	X	X	X										X		
2	ES104	7/21/14	1000	GW	10		X	X	X	X	X										X		
3	ES104 MS/MSD	7/21/14	1000	GW	10		X	X	X	X	X										X		
4	ES105	7/21/14	1055	GW	10		X	X	X	X	X										X		
5	ES TRIP	7/21/14	0800	water	3		X	X	X	X	X										X		

Relinquished by: (Signature) Jeff Hammer	Received by: (Signature/Affiliation)	Date: 7/22/14	Time: 1700
Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date: 7/22/14	Time: 0940

SHIP DATE: 21JUL14
ACTWGT: 59.1 LB
CAD: /POS1501
DIMS: 24x13x11 IN
BILL RECIPIENT

UNITED STATES US

TO **SAMPLE CONTROL**
CALSCIENCE LABORATORIES
7440 LINCOLN WAY

GARDEN GROVE CA 92841

(714) 895-5494

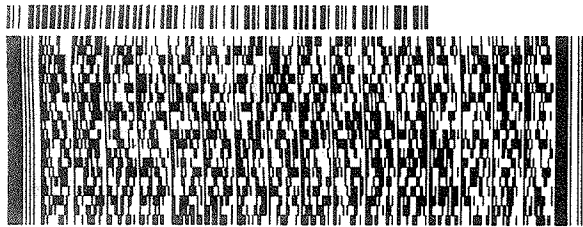
THU:
PO:

REF:

DEPT:

9176205 07/21 523627ED4F/86C9 762951 # REG

7466



FedEx
Express



J14201406190126

2 of 2

TUE - 22 JUL AA

MPS# **7800 4230 7911**

OS81

STANDARD OVERNIGHT

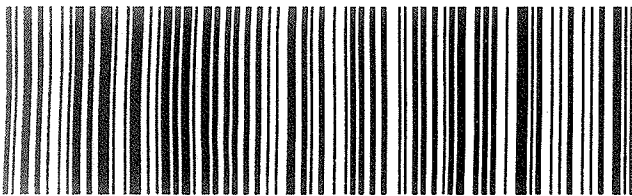
Mstr# 8045 5791 7456

0200

WZ APVA

92841

CA-US **SNA**



ORIGIN ID:HNLA

SHIP DATE: 21 JUL 14
ACTWGT: 49.3 LB
CAD: /POS1501
DIMS: 24x13x14 IN
BILL RECIPIENT

UNITED STATES US

TO **SAMPLE CONTROL**
CALSCIENCE LABORATORIES
7440 LINCOLN WAY

GARDEN GROVE CA 92841

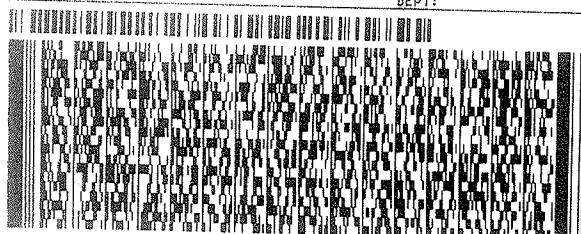
(714) 895-5494

THU:
PO:

REF:

DEPT:

9176205 07/21 523627ED4F/86C9 762951 # REG



FedEx
Express



J14201406190126

1 of 2

TUE - 22 JUL AA

TRK# **8045 5791 7456**

0200

STANDARD OVERNIGHT

MASTER

WZ APVA

92841

CA-US **SNA**

Calscience

WORK ORDER #: 14-07-1466

SAMPLE RECEIPT FORM

Cooler 1 of 2

CLIENT: Env. Science

DATE: 07/22/14

TEMPERATURE: Thermometer ID: SC1 (Criteria: 0.0 °C – 6.0 °C, not frozen except sediment/tissue)

Temperature 2.9 °C - 0.3 °C (CF) = 2.6 °C ☒ Blank ☐ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____)

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.

☐ Received at ambient temperature, placed on ice for transport by Courier.

Ambient Temperature: ☐ Air ☐ Filter

Checked by: 15

CUSTODY SEALS INTACT:

☒ Cooler ☐ _____ ☐ No (Not Intact) ☐ Not Present ☐ N/A Checked by: 15

☒ Sample ☐ _____ ☐ No (Not Intact) ☐ Not Present Checked by: 659

SAMPLE CONDITION:

	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COC document(s) received complete.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels.

☐ No analysis requested. ☐ Not relinquished. ☐ No date/time relinquished.

Sampler's name indicated on COC.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------------------	-------------------------------------	--------------------------	--------------------------

Sample container label(s) consistent with COC.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--	-------------------------------------	--------------------------	--------------------------

Sample container(s) intact and good condition.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--	-------------------------------------	--------------------------	--------------------------

Proper containers and sufficient volume for analyses requested.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
---	-------------------------------------	--------------------------	--------------------------

Analyses received within holding time.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--	-------------------------------------	--------------------------	--------------------------

Aqueous samples received within 15-minute holding time

<input type="checkbox"/> pH <input type="checkbox"/> Residual Chlorine <input type="checkbox"/> Dissolved Sulfides <input type="checkbox"/> Dissolved Oxygen.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
---	--------------------------	--------------------------	-------------------------------------

Proper preservation noted on COC or sample container.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
---	-------------------------------------	--------------------------	--------------------------

☒ Unpreserved vials received for Volatiles analysis

Volatile analysis container(s) free of headspace.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
---	-------------------------------------	--------------------------	--------------------------

Tedlar bag(s) free of condensation.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
---	--------------------------	--------------------------	-------------------------------------

CONTAINER TYPE:

Solid: ☐ 4ozCGJ ☐ 8ozCGJ ☐ 16ozCGJ ☐ Sleeve (____) ☐ EnCores® ☐ TerraCores® ☐ _____

Aqueous: ☒ VOA ☒ VOA⁽¹⁴⁾ ☐ VOAna₂ ☐ 125AGB ☐ 125AGBh ☐ 125AGBp ☒ 1AGB ☐ 1AGBna₂ ☐ 1AGBs

☐ 500AGB ☒ 500AGJ ☐ 500AGJs ☐ 250AGB ☐ 250CGB ☐ 250CGBs ☐ 1PB ☐ 1PBna ☐ 500PB

☐ 250PB ☒ 250PBna ☐ 125PB ☐ 125PBz₂na ☐ 100PJ ☐ 100PJna₂ ☐ _____ ☐ _____

Air: ☐ Tedlar® ☐ Canister Other: ☐ _____ Trip Blank Lot#: 140422A Labeled/Checked by: 659

Container: C: Clear A: Amber P: Plastic G: Glass J: Jar B: Bottle Z: Ziploc/Resealable Bag E: Envelope Reviewed by: 778

Preservative: h: HCL n: HNO₃ na₂: Na₂S₂O₃ na: NaOH p: H₃PO₄ s: H₂SO₄ u: Ultra-pure z₂na: ZnAc₂+NaOH f: Filtered Scanned by: 778

*(-2) Received 10-vials, 4 - 1AGB, 3 - 500AGJ, 3 - 250PBna (659)

Calscience

WORK ORDER #: 14-07-11466

SAMPLE RECEIPT FORM

Cooler 2 of 2

CLIENT: Env. Science

DATE: 07/22/14

TEMPERATURE: Thermometer ID: SC1 (Criteria: 0.0 °C – 6.0 °C, not frozen except sediment/tissue)

Temperature 2.4 °C - 0.3 °C (CF) = 2.1 °C ☒ Blank ☐ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____)

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.

☐ Received at ambient temperature, placed on ice for transport by Courier.

Ambient Temperature: ☐ Air ☐ Filter

Checked by: 15

CUSTODY SEALS INTACT:

☒ Cooler ☐ _____ ☐ No (Not Intact) ☐ Not Present ☐ N/A Checked by: 15

☒ Sample ☐ _____ ☐ No (Not Intact) ☐ Not Present Checked by: 659

SAMPLE CONDITION:

	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COC document(s) received complete.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels.

☐ No analysis requested. ☐ Not relinquished. ☐ No date/time relinquished.

Sampler's name indicated on COC.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------------------	-------------------------------------	--------------------------	--------------------------

Sample container label(s) consistent with COC.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--	-------------------------------------	--------------------------	--------------------------

Sample container(s) intact and good condition.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--	-------------------------------------	--------------------------	--------------------------

Proper containers and sufficient volume for analyses requested.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
---	-------------------------------------	--------------------------	--------------------------

Analyses received within holding time.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--	-------------------------------------	--------------------------	--------------------------

Aqueous samples received within 15-minute holding time

<input type="checkbox"/> pH <input type="checkbox"/> Residual Chlorine <input type="checkbox"/> Dissolved Sulfides <input type="checkbox"/> Dissolved Oxygen.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
---	--------------------------	--------------------------	-------------------------------------

Proper preservation noted on COC or sample container.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
---	-------------------------------------	--------------------------	--------------------------

☐ Unpreserved vials received for Volatiles analysis

Volatile analysis container(s) free of headspace.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
---	--------------------------	--------------------------	-------------------------------------

Tedlar bag(s) free of condensation.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
---	--------------------------	--------------------------	-------------------------------------

CONTAINER TYPE:

Solid: ☐ 4ozCGJ ☐ 8ozCGJ ☐ 16ozCGJ ☐ Sleeve (_____) ☐ EnCores® ☐ TerraCores® ☐ _____

Aqueous: ☐ VOA ☐ VOA_h ☐ VOA_{na2} ☐ 125AGB ☐ 125AGB_h ☐ 125AGB_p ☒ 1AGB ☐ 1AGB_{na2} ☐ 1AGB_s
☐ 500AGB ☒ 500AGJ ☐ 500AGJ_s ☐ 250AGB ☐ 250CGB ☐ 250CGB_s ☐ 1PB ☐ 1PB_{na} ☐ 500PB

☐ 250PB ☐ 250PB_n ☐ 125PB ☐ 125PB_{znna} ☐ 100PJ ☐ 100PJ_{na2} ☐ _____ ☐ _____ ☐ _____

Air: ☐ Tedlar® ☐ Canister Other: ☐ _____ Trip Blank Lot#: _____ Labeled/Checked by: 659

Container: C: Clear A: Amber P: Plastic G: Glass J: Jar B: Bottle Z: Ziploc/Resealable Bag E: Envelope Reviewed by: 776

Preservative: h: HCL n: HNO₃ na₂: Na₂S₂O₃ na: NaOH p: H₃PO₄ s: H₂SO₄ u: Ultra-pure znna: ZnAc₂+NaOH f: Filtered Scanned by: 776

**RAW DATA SHEET
FOR METHOD: EPA 8015B (M)**

WORK ORDER: 14-07-1466
INSTRUMENT: GC 45
EXTRACTION: EPA 3510C
D/T EXTRACTED: 2014-07-23 00:00

ANALYZED BY: 628
D/T ANALYZED: 2014-07-24 21:13
REVIEWED BY:
D/T REVIEWED:

DATA FILE: W:\GC_45\GC 45 DATA\2014\140724\14072415.D\14072415

1 **CLIENT SAMPLE NUMBER: ES103**

LCS/MB BATCH: 140723B11A	SAMPLE VOLUME / WEIGHT: DEFAULT: 500.00 ml / ACTUAL: 500.00 ml
MS/MSD BATCH: 140723S11A	FINAL VOLUME / WEIGHT: DEFAULT: 5.00 ml / ACTUAL: 2.50 ml
UNITS: ug/L	ADJUSTMENT RATIO TO PF: 0.50

COMMENT: Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

<u>COMPOUND</u>	<u>INI. CONC</u>	<u>DF</u>	<u>CONC</u>	<u>DL</u>	<u>LOD</u>	<u>LOQ</u>	<u>QUAL</u>
TPH as Diesel	13300	1.00	66.7	11	12	25	b

Area Percent Report

Data File Name : W:\GC_45\GC 45 DATA\2014\140724\14072415.D
 Page Number : 1
 Operator : 682 Vial Number : Vial 15
 Instrument : GC 45 Injection Number : 1
 Sample Name : 14-07-1466-1 Sequence Line : 15
 Instrument Method: C:\CHEM32\1\METHODS\ ->
 Acquired on : 24 Jul 14 9:13:38 PM
 Report Created on: 25 Jul 14 06:11 pm Analysis Method : 8015B.MTH

Software Revision: Rev. B.04.03-SP1 [87] Copyright © Agilent Technologies

Sig. 1 in W:\GC_45\GC 45 DATA\2014\140724\ ->

Pk	Ret Time	Area	Height	Peak	Width	Response %
1	2.142	0.41		0 VV	0.027	0.030
2	2.272	5.28		3 VV	0.026	0.392
3	2.299	1.55		1 VV	0.018	0.115
4	2.335	1.49		1 VV	0.020	0.110
5	2.382	1.89		1 VV	0.020	0.140
6	2.402	0.98		1 VV	0.015	0.073
7	2.435	1.27		1 VV	0.020	0.094
8	2.475	3.67		2 VV	0.025	0.273
9	2.513	5.66		4 VV	0.024	0.420
10	2.559	4.22		2 VV	0.026	0.314
11	2.593	2.54		2 VV	0.023	0.189
12	2.647	5.64		2 VV	0.039	0.419
13	2.688	5.74		2 VV	0.033	0.427
14	2.777	13.85		4 VV	0.047	1.030
15	2.808	10.68		5 VV	0.029	0.794
16	2.870	5.38		4 VV	0.020	0.400
17	2.886	3.77		4 VV	0.013	0.280
18	2.907	8.36		6 VV	0.020	0.622
19	2.938	11.55		8 VV	0.020	0.859
20	2.997	17.08		5 VV	0.044	1.269
21	3.063	10.17		4 VV	0.033	0.756
22	3.104	5.33		4 VV	0.020	0.396
23	3.123	2.22		3 VV	0.012	0.165
24	3.147	7.96		4 VV	0.028	0.592
25	3.220	20.24		11 VV	0.026	1.504
26	3.246	4.01		3 VV	0.021	0.298
27	3.286	5.37		3 VV	0.028	0.399
28	3.357	12.11		3 VV	0.046	0.900
29	3.387	7.69		3 VV	0.035	0.571
30	3.438	2.67		2 VV	0.021	0.199
31	3.497	9.95		3 VV	0.044	0.739
32	3.549	9.61		3 VV	0.047	0.714
33	3.616	8.98		3 VV	0.040	0.667
34	3.661	4.05		3 VV	0.022	0.301
35	3.699	4.70		2 VV	0.029	0.349
36	3.744	5.38		2 VV	0.033	0.400
37	3.772	3.19		2 VV	0.023	0.237
38	3.806	4.31		2 VV	0.029	0.320
39	3.833	2.79		2 VV	0.027	0.208
40	3.872	2.04		2 VV	0.019	0.151
41	3.896	2.75		2 VV	0.021	0.204
42	3.912	2.87		2 VV	0.030	0.213
43	3.960	2.17		1 VV	0.021	0.161
44	3.986	5.24		2 VV	0.042	0.389
45	4.058	4.90		3 VV	0.022	0.364

Area Percent Report

Data File Name : W:\GC_45\GC 45 DATA\2014\140724\14072415.D
 Page Number : 2
 Operator : 682 Vial Number : Vial 15
 Instrument : GC 45 Injection Number : 1
 Sample Name : 14-07-1466-1 Sequence Line : 15
 Instrument Method: C:\CHEM32\1\METHODS\ ->
 Acquired on : 24 Jul 14 9:13:38 PM
 Report Created on: 25 Jul 14 06:11 pm Analysis Method : 8015B.MTH

Software Revision: Rev. B.04.03-SP1 [87] Copyright © Agilent Technologies

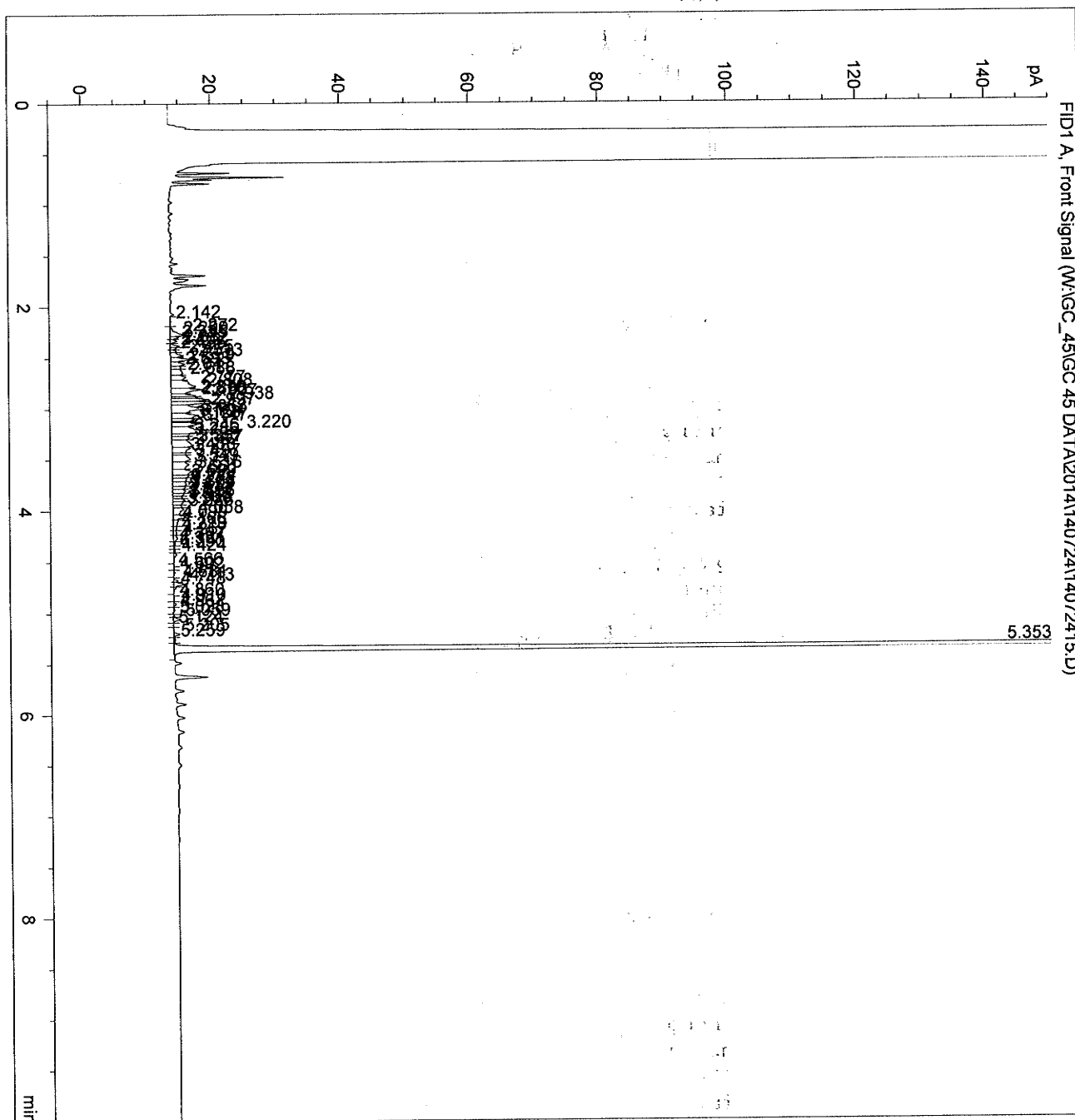
Pk	Ret Time	Area	Height	Peak	Width	Response %
46	4.099	2.43	1	VV	0.041	0.180
47	4.166	1.21	1	VV	0.030	0.090
48	4.218	1.17	1	VV	0.028	0.087
49	4.267	1.72	1	VV	0.032	0.128
50	4.307	0.61	0	VV	0.028	0.045
51	4.351	0.33	0	VV	0.025	0.024
52	4.390	0.41	0	VV	0.024	0.030
53	4.424	1.06	1	VB	0.030	0.079
54	4.566	0.00	0	BV	0.000	0.000
55	4.602	0.29	0	VB	0.021	0.021
56	4.681	0.85	1	BV	0.018	0.063
57	4.713	2.88	2	VV	0.024	0.214
58	4.748	0.54	0	VB	0.021	0.040
59	4.860	0.30	0	BV	0.023	0.022
60	4.910	0.61	0	VV	0.022	0.045
61	4.967	0.35	0	VB	0.020	0.026
62	5.028	0.26	0	BV	0.017	0.019
63	5.059	1.69	1	VV	0.022	0.126
64	5.124	0.06	0	VV	0.031	0.004
65	5.205	1.43	1	VV	0.023	0.106
66	5.259	0.58	0	VV	0.035	0.043
67	5.353	1065.17	811	VV	0.020	79.157

Total area = 1345.64

Area Percent Report

Data File Name : W:\GC_45\GC 45 DATA\2014\140724\14072415.D
 Page Number : 3
 Operator : 682 Vial Number : Vial 15
 Instrument : GC 45 Injection Number : 1
 Sample Name : 14-07-1466-1 Sequence Line : 15
 Instrument Method: C:\CHEM32\1\METHODS\ ->
 Acquired on : 24 Jul 14 9:13:38 PM
 Report Created on: 25 Jul 14 06:11 pm Analysis Method : 8015B.MTH

Software Revision: Rev. B.04.03-SP1 [87] Copyright © Agilent Technologies



RAW DATA SHEET FOR METHOD: EPA 8015B (M)

WORK ORDER: 14-07-1466
INSTRUMENT: GC 45
EXTRACTION: EPA 3510C
D/T EXTRACTED: 2014-07-23 00:00

ANALYZED BY: 628
D/T ANALYZED: 2014-07-24 21:30
REVIEWED BY:
D/T REVIEWED:

DATA FILE: W:\GC 45\GC 45 DATA\2014\140724\14072416.D\14072416

2 **CLIENT SAMPLE NUMBER:** ES104

LCS/MB BATCH: 140723B11A	SAMPLE VOLUME / WEIGHT: DEFAULT: 500.00 ml / ACTUAL: 500.00 ml
MS/MSD BATCH: 140723S11A	FINAL VOLUME / WEIGHT: DEFAULT: 5.00 ml / ACTUAL: 2.50 ml
UNITS: ug/L	ADJUSTMENT RATIO TO PF: 0.50

COMMENT: Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

<u>COMPOUND</u>	<u>INI. CONC</u>	<u>DF</u>	<u>CONC</u>	<u>DL</u>	<u>LOD</u>	<u>LOQ</u>	<u>QUAL</u>
TPH as Diesel	236000	1.00	1180	11	12	25	b

Area Percent Report

Data File Name : W:\GC_45\GC 45 DATA\2014\140724\14072416.D
 Page Number : 1
 Operator : 682 Vial Number : Vial 16
 Instrument : GC 45 Injection Number : 1
 Sample Name : 14-07-1466-2 Sequence Line : 16
 Instrument Method: C:\CHEM32\1\METHODS\ ->
 Acquired on : 24 Jul 14 9:30:56 PM
 Report Created on: 29 Jul 14 01:05 pm Analysis Method : 8015B.MTH

Software Revision: Rev. B.04.03-SP1 [87] Copyright © Agilent Technologies

Sig. 1 in W:\GC_45\GC 45 DATA\2014\140724\ ->

Pk	Ret Time	Area	Height	Peak	Width	Response %
1	1.944	8.11	4 VV	0.030	0.138	
2	1.994	26.82	16 VV	0.024	0.455	
3	2.077	58.15	56 VV	0.016	0.987	
4	2.107	28.67	27 VV	0.016	0.487	
5	2.136	35.34	22 VV	0.022	0.600	
6	2.220	151.81	84 VV	0.028	2.578	
7	2.271	52.19	29 VV	0.025	0.886	
8	2.304	69.93	54 VV	0.020	1.187	
9	2.333	21.11	18 VV	0.017	0.358	
10	2.371	69.23	42 VV	0.024	1.175	
11	2.401	91.73	74 VV	0.018	1.558	
12	2.436	62.19	42 VV	0.021	1.056	
13	2.507	466.71	324 VV	0.021	7.925	
14	2.559	38.11	28 VV	0.019	0.647	
15	2.596	79.47	36 VV	0.028	1.349	
16	2.616	36.59	31 VV	0.017	0.621	
17	2.650	77.13	40 VV	0.029	1.310	
18	2.690	96.26	44 VV	0.029	1.635	
19	2.731	53.13	40 VV	0.020	0.902	
20	2.781	281.08	146 VV	0.026	4.773	
21	2.822	259.67	157 VV	0.023	4.409	
22	2.871	52.51	49 VV	0.016	0.892	
23	2.905	189.91	83 VV	0.031	3.225	
24	2.938	126.05	61 VV	0.028	2.140	
25	2.998	179.68	67 VV	0.039	3.051	
26	3.035	58.66	50 VV	0.017	0.996	
27	3.066	195.20	104 VV	0.026	3.314	
28	3.111	132.36	68 VV	0.029	2.248	
29	3.145	103.41	47 VV	0.030	1.756	
30	3.193	100.22	49 VV	0.028	1.702	
31	3.223	56.86	44 VV	0.018	0.965	
32	3.242	75.74	42 VV	0.027	1.286	
33	3.282	71.53	39 VV	0.026	1.215	
34	3.335	132.16	51 VV	0.036	2.244	
35	3.355	56.69	51 VV	0.016	0.963	
36	3.380	94.90	53 VV	0.025	1.611	
37	3.413	47.97	35 VV	0.019	0.815	
38	3.440	55.29	37 VV	0.021	0.939	
39	3.486	106.30	43 VV	0.032	1.805	
40	3.506	80.63	43 VV	0.025	1.369	
41	3.550	63.43	42 VV	0.022	1.077	
42	3.572	81.73	42 VV	0.029	1.388	
43	3.615	117.41	43 VV	0.038	1.994	
44	3.667	94.65	35 VV	0.038	1.607	
45	3.700	38.76	31 VV	0.021	0.658	

Area Percent Report

Data File Name : W:\GC_45\GC 45 DATA\2014\140724\14072416.D
 Page Number : 2
 Operator : 682 Vial Number : Vial 16
 Instrument : GC 45 Injection Number : 1
 Sample Name : 14-07-1466-2 Sequence Line : 16
 Instrument Method: C:\CHEM32\1\METHODS\ ->
 Acquired on : 24 Jul 14 9:30:56 PM
 Report Created on: 29 Jul 14 01:05 pm Analysis Method : 8015B.MTH

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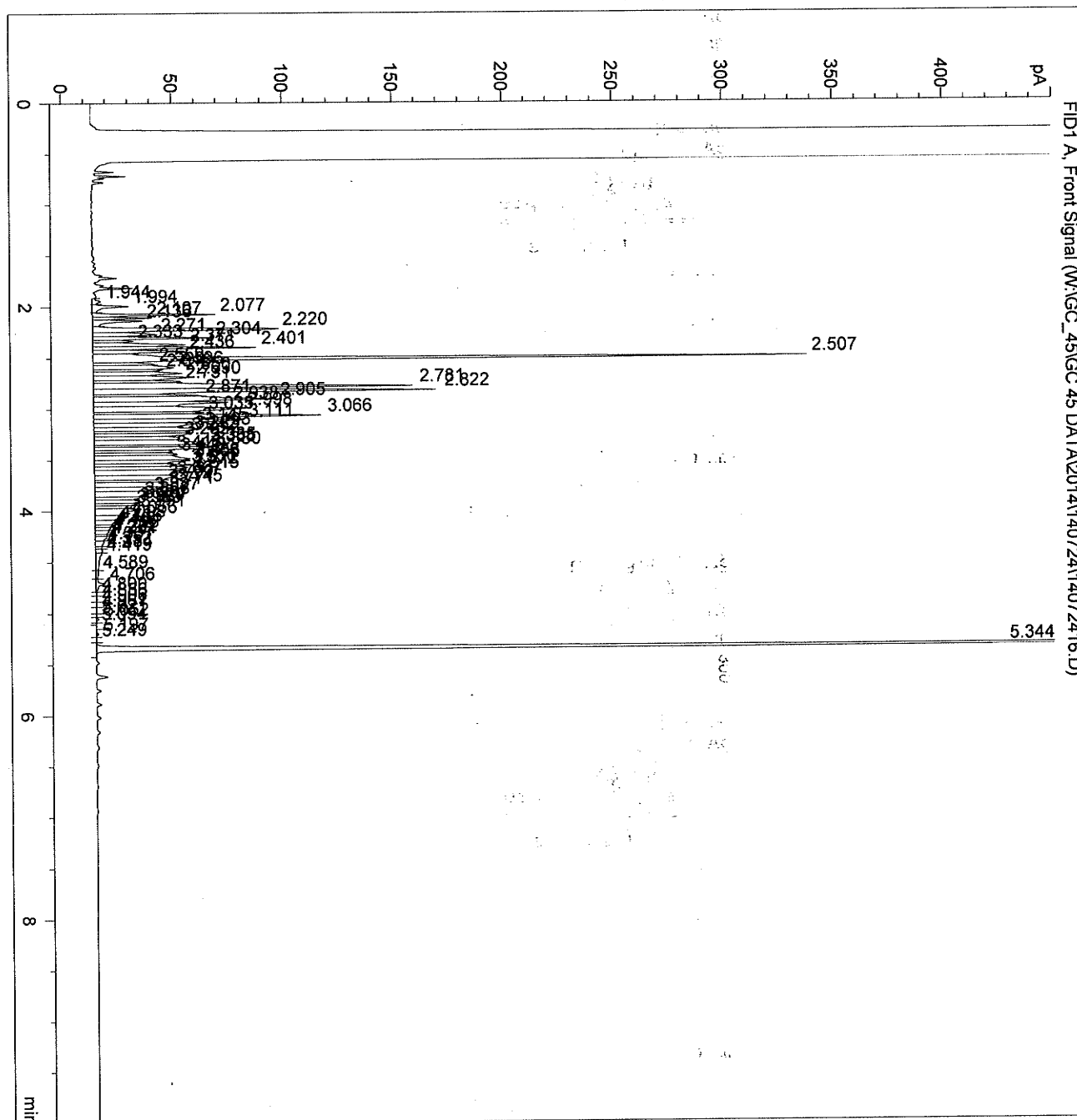
Pk	Ret Time	Area	Height	Peak	Width	Response %
46	3.745	90.24		35 VV	0.034	1.532
47	3.771	64.83		32 VV	0.029	1.101
48	3.827	76.08		25 VV	0.045	1.292
49	3.868	34.64		20 VV	0.024	0.588
50	3.907	38.12		20 VV	0.027	0.647
51	3.929	24.21		18 VV	0.018	0.411
52	3.953	25.33		17 VV	0.024	0.430
53	3.991	60.08		18 VV	0.043	1.020
54	4.056	34.15		15 VV	0.033	0.580
55	4.098	22.78		9 VV	0.032	0.387
56	4.136	10.52		8 VV	0.020	0.179
57	4.164	12.26		7 VV	0.025	0.208
58	4.196	13.83		6 VV	0.032	0.235
59	4.232	6.45		5 VV	0.017	0.110
60	4.251	12.16		5 VV	0.038	0.206
61	4.307	11.66		4 VV	0.044	0.198
62	4.352	3.90		3 VV	0.018	0.066
63	4.384	6.84		3 VV	0.030	0.116
64	4.419	17.93		3 VV	0.076	0.304
65	4.589	4.78		1 VV	0.053	0.081
66	4.706	11.05		4 VV	0.036	0.188
67	4.800	1.13		1 VV	0.028	0.019
68	4.856	1.60		1 VV	0.035	0.027
69	4.906	1.18		0 VV	0.031	0.020
70	4.961	1.18		1 VV	0.030	0.020
71	5.021	0.43		0 VV	0.021	0.007
72	5.052	1.69		1 VV	0.023	0.029
73	5.094	0.05		0 VV	0.016	0.001
74	5.197	1.35		1 BV	0.023	0.023
75	5.249	0.42		0 VV	0.026	0.007
76	5.344	922.91		653 VV	0.023	15.671

Total area = 5889.27

Area Percent Report

Data File Name : W:\GC_45\GC 45 DATA\2014\140724\14072416.D
 Page Number : 3
 Operator : 682 Vial Number : Vial 16
 Instrument : GC 45 Injection Number : 1
 Sample Name : 14-07-1466-2 Sequence Line : 16
 Instrument Method: C:\CHEM32\1\METHODS\ ->
 Acquired on : 24 Jul 14 9:30:56 PM
 Report Created on: 29 Jul 14 01:05 pm Analysis Method : 8015B.MTH

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RAW DATA SHEET FOR METHOD: EPA 8015B (M)

WORK ORDER: 14-07-1466
INSTRUMENT: GC 45
EXTRACTION: EPA 3510C
D/T EXTRACTED: 2014-07-23 00:00

ANALYZED BY: 628
D/T ANALYZED: 2014-07-24 21:48
REVIEWED BY:
D/T REVIEWED:

DATA FILE: W:\GC 45\GC 45 DATA\2014\140724\14072417.D\14072417

3 **CLIENT SAMPLE NUMBER: ES105**

LCS/MB BATCH: 140723B11A	SAMPLE VOLUME / WEIGHT: DEFAULT: 500.00 ml / ACTUAL: 500.00 ml
MS/MSD BATCH: 140723S11A	FINAL VOLUME / WEIGHT: DEFAULT: 5.00 ml / ACTUAL: 2.50 ml
UNITS: ug/L	ADJUSTMENT RATIO TO PF: 0.50

COMMENT: Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

COMPOUND	INI. CONC	DF	CONC	DL	LOD	LOQ	QUAL
TPH as Diesel	265000	1.00	1320	11	12	25	b

Area Percent Report

Data File Name : W:\GC_45\GC 45 DATA\2014\140724\14072417.D
 Page Number : 1
 Operator : 682 Vial Number : Vial 17
 Instrument : GC 45 Injection Number : 1
 Sample Name : 14-07-1466-3 Sequence Line : 17
 Instrument Method: C:\CHEM32\1\METHODS\ ->
 Acquired on : 24 Jul 14 9:48:52 PM
 Report Created on: 29 Jul 14 01:05 pm Analysis Method : 8015B.MTH

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Sig. 1 in W:\GC_45\GC 45 DATA\2014\140724\ ->

Pk	Ret Time	Area	Height	Peak	Width	Response %
1	1.945	9.80		5 VV	0.030	0.146
2	1.994	31.86		19 VV	0.025	0.476
3	2.077	66.79		63 VV	0.016	0.998
4	2.107	33.21		31 VV	0.016	0.496
5	2.136	41.20		26 VV	0.024	0.616
6	2.219	176.26		96 VV	0.029	2.633
7	2.271	60.30		33 VV	0.030	0.901
8	2.304	82.33		62 VV	0.020	1.230
9	2.334	23.70		21 VV	0.016	0.354
10	2.371	80.18		48 VV	0.024	1.198
11	2.401	107.56		90 VV	0.018	1.607
12	2.437	71.67		48 VV	0.023	1.071
13	2.507	538.09		371 VV	0.021	8.038
14	2.560	47.85		32 VV	0.021	0.715
15	2.597	87.08		40 VV	0.028	1.301
16	2.617	41.00		35 VV	0.017	0.612
17	2.653	85.64		44 VV	0.029	1.279
18	2.691	107.63		48 VV	0.031	1.608
19	2.731	58.32		44 VV	0.019	0.871
20	2.782	323.90		177 VV	0.025	4.839
21	2.822	298.78		181 VV	0.023	4.463
22	2.906	264.71		89 VV	0.039	3.954
23	2.939	137.94		67 VV	0.027	2.061
24	2.998	195.07		74 VV	0.038	2.914
25	3.037	68.68		57 VV	0.017	1.026
26	3.067	216.73		121 VV	0.024	3.238
27	3.111	145.33		75 VV	0.028	2.171
28	3.146	113.40		52 VV	0.028	1.694
29	3.194	112.52		53 VV	0.028	1.681
30	3.223	79.27		46 VV	0.022	1.184
31	3.250	58.65		45 VV	0.022	0.876
32	3.283	69.30		43 VV	0.023	1.035
33	3.333	135.78		56 VV	0.032	2.028
34	3.355	75.60		56 VV	0.020	1.129
35	3.380	111.65		56 VV	0.028	1.668
36	3.416	48.71		39 VV	0.018	0.728
37	3.441	66.84		40 VV	0.023	0.998
38	3.487	100.77		47 VV	0.030	1.505
39	3.506	91.91		47 VV	0.027	1.373
40	3.551	68.65		45 VV	0.021	1.026
41	3.575	89.78		47 VV	0.028	1.341
42	3.617	107.77		48 VV	0.031	1.610
43	3.644	34.70		38 VV	0.015	0.518
44	3.667	69.31		39 VV	0.026	1.035
45	3.689	59.20		35 VV	0.025	0.884

Area Percent Report

Data File Name : W:\GC_45\GC 45 DATA\2014\140724\14072417.D
 Page Number : 2
 Operator : 682 Vial Number : Vial 17
 Instrument : GC 45 Injection Number : 1
 Sample Name : 14-07-1466-3 Sequence Line : 17
 Instrument Method: C:\CHEM32\1\METHODS\ ->
 Acquired on : 24 Jul 14 9:48:52 PM
 Report Created on: 29 Jul 14 01:05 pm Analysis Method : 8015B.MTH

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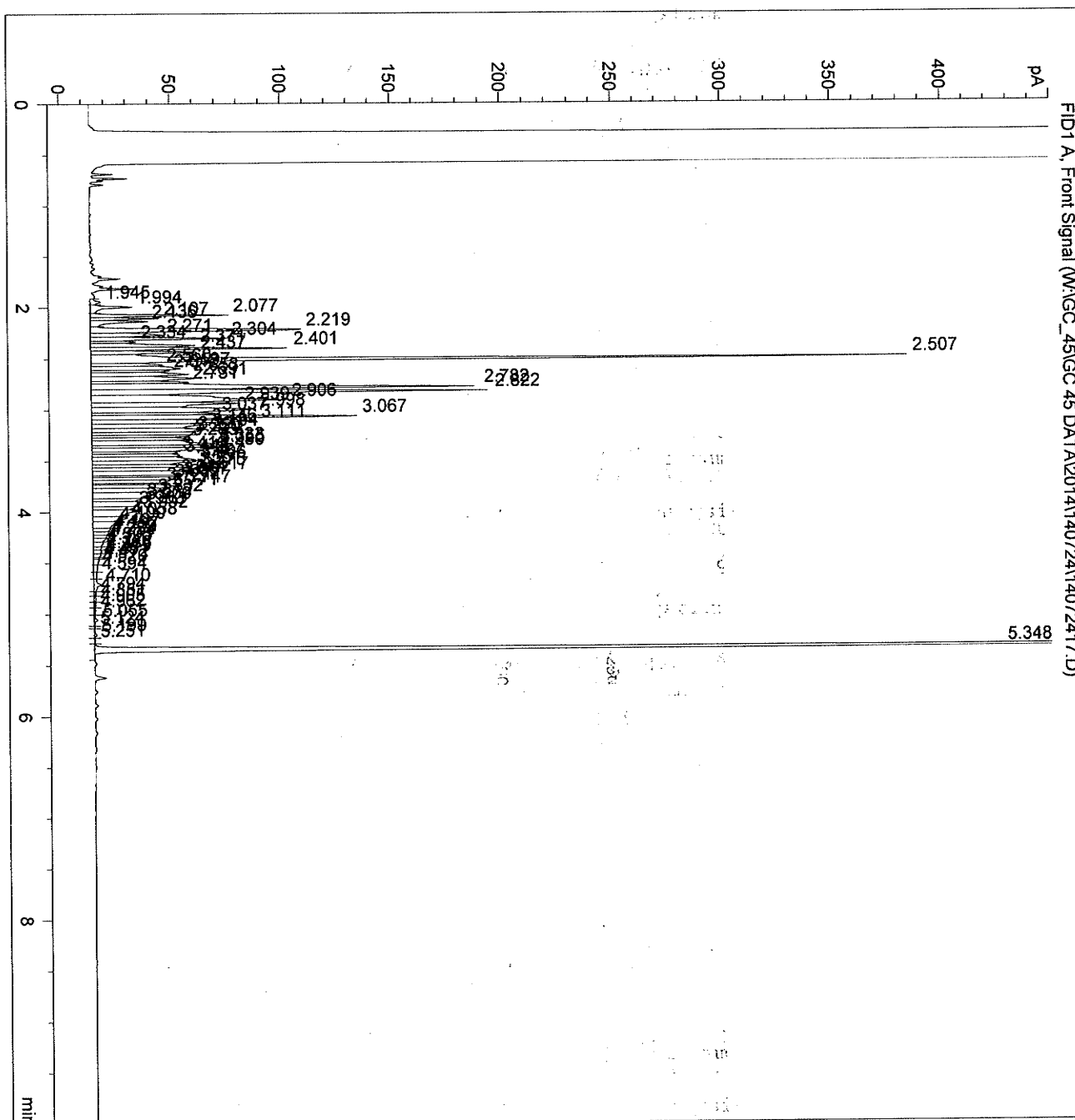
Pk	Ret Time	Area	Height	Peak	Width	Response %
46	3.721	27.51	31	VV	0.015	0.411
47	3.747	70.09	40	VV	0.023	1.047
48	3.771	73.69	34	VV	0.030	1.101
49	3.832	91.10	27	VV	0.043	1.361
50	3.872	36.78	22	VV	0.027	0.549
51	3.909	60.17	22	VV	0.036	0.899
52	3.953	33.43	19	VV	0.027	0.499
53	3.992	65.23	20	VV	0.041	0.974
54	4.058	37.63	15	VV	0.033	0.562
55	4.100	35.70	10	VV	0.044	0.533
56	4.167	15.18	8	VV	0.026	0.227
57	4.197	14.10	7	VV	0.027	0.211
58	4.229	9.65	6	VV	0.021	0.144
59	4.254	12.68	6	VV	0.036	0.189
60	4.303	11.50	4	VV	0.038	0.172
61	4.349	6.21	4	VV	0.024	0.093
62	4.386	7.68	4	VV	0.028	0.115
63	4.419	7.29	4	VV	0.029	0.109
64	4.451	2.33	3	VV	0.015	0.035
65	4.472	7.09	3	VV	0.035	0.106
66	4.520	7.25	2	VV	0.048	0.108
67	4.594	5.48	1	VV	0.061	0.082
68	4.710	12.26	3	VV	0.052	0.183
69	4.794	2.35	1	VV	0.040	0.035
70	4.851	2.83	1	VV	0.042	0.042
71	4.905	2.36	1	VV	0.042	0.035
72	4.962	2.53	1	VV	0.044	0.038
73	5.055	4.44	2	VV	0.036	0.066
74	5.124	0.50	0	VV	0.018	0.007
75	5.199	2.89	1	VV	0.034	0.043
76	5.251	1.43	1	VV	0.039	0.021
77	5.348	1129.37	860	VV	0.020	16.871

Total area = 6694.13

Area Percent Report

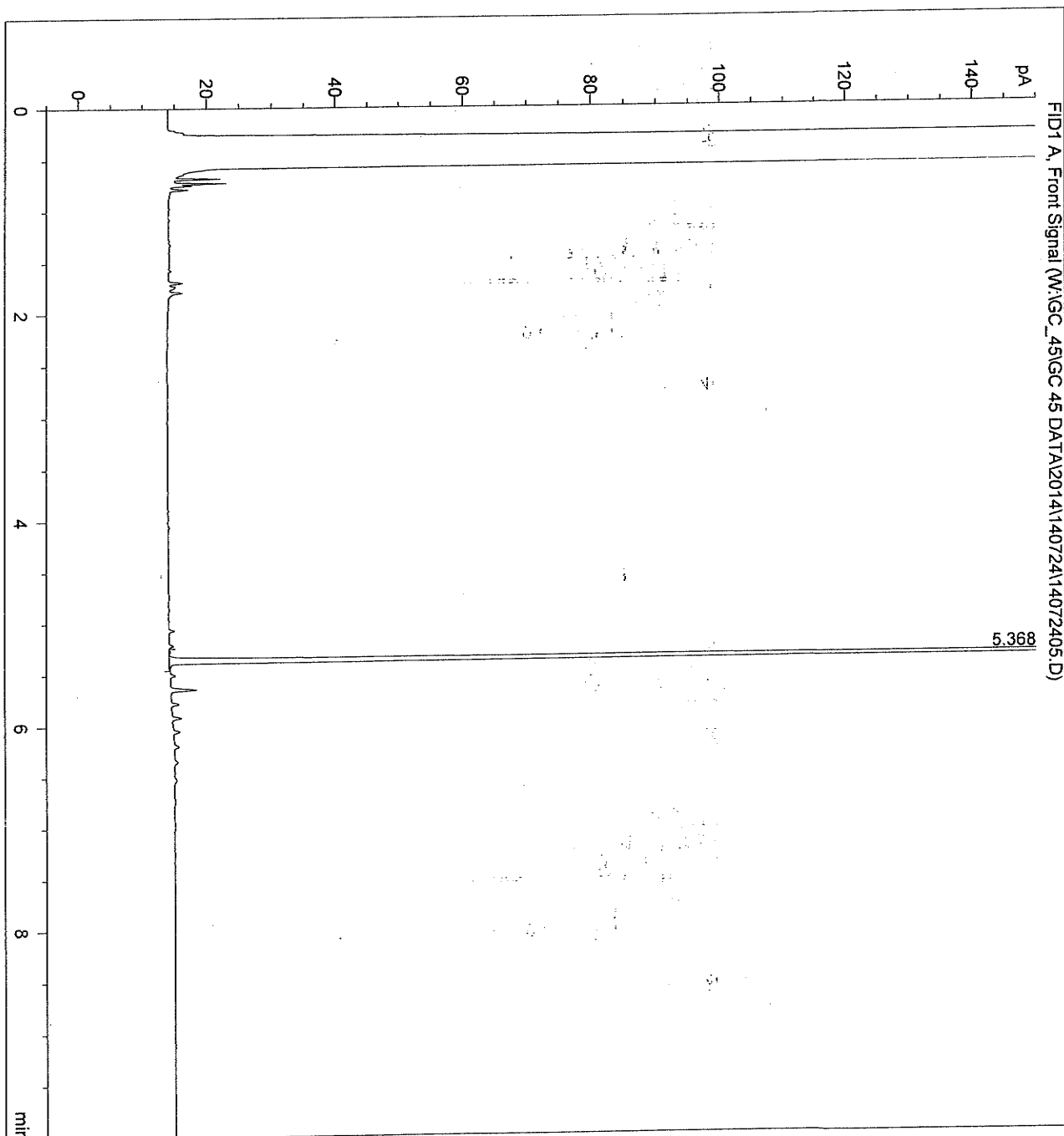
Data File Name : W:\GC_45\GC 45 DATA\2014\140724\14072417.D
 Page Number : 3
 Operator : 682 Vial Number : Vial 17
 Instrument : GC 45 Injection Number : 1
 Sample Name : 14-07-1466-3 Sequence Line : 17
 Instrument Method: C:\CHEM32\1\METHODS\ ->
 Acquired on : 24 Jul 14 9:48:52 PM
 Report Created on: 29 Jul 14 01:05 pm Analysis Method : 8015B.MTH

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Area Percent Report

Data File Name : W:\GC_45\GC 45 DATA\2014\140724\14072405.D
Page Number : 2
Operator : 682 Vial Number : Vial 5
Instrument : GC 45 Injection Number : 1
Sample Name : MB 14072311/12 Sequence Line : 5
Instrument Method: C:\CHEM32\1\METHODS\ ->
Acquired on : 24 Jul 14 6:11:35 PM
Report Created on: 25 Jul 14 06:10 pm Analysis Method : 8015B.MTH
Software Revision: Rev. B.04.03-SP1 [87] Copyright © Agilent Technologies



Blank

Area Percent Report

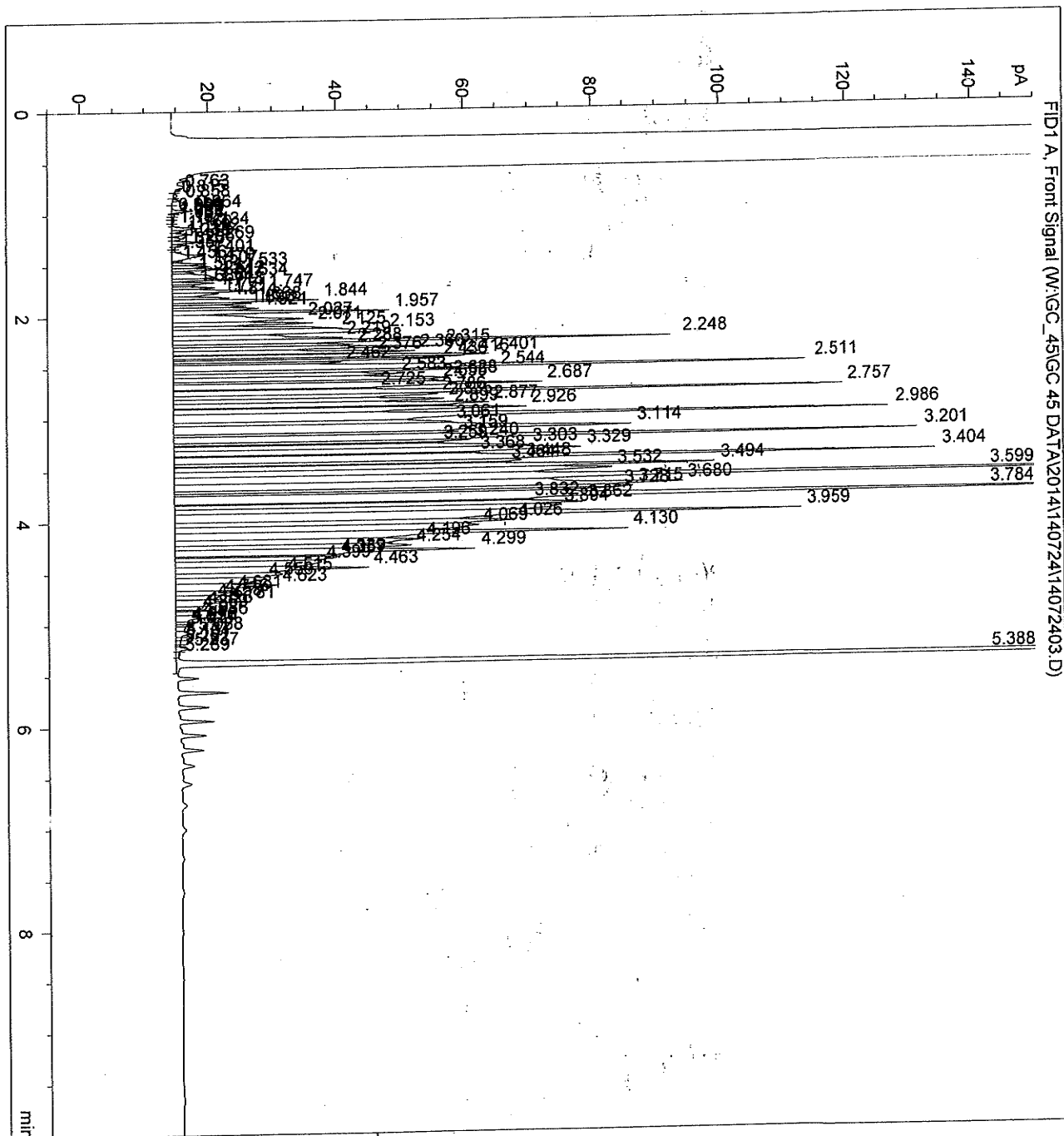
Data File Name : W:\GC_45\GC 45 DATA\2014\140724\14072403.D
 Page Number : 4
 Operator : 682
 Instrument : GC 45
 Sample Name : D400 C28 50 L041814D

Vial Number : Vial 3
 Injection Number : 1
 Sequence Line : 3
 Instrument Method: C:\CHEM32\1\METHODS\

Acquired on : 24 Jul 14 5:36:31 PM
 Report Created on: 25 Jul 14 06:10 pm

Analysis Method : 8015B.MTH

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Supplemental Report 1

**WORK ORDER NUMBER: 14-07-1550***The difference is service*

AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For**Client:** Environmental Science International, Inc.**Client Project Name:** Red Hill 112066**Attention:** Robert Chong
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

 Approved for release on 07/30/2014 by:
 Richard Villafania
 Project Manager

ResultLink ▶

Email your PM ▶



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Contents

Client Project Name: Red Hill 112066
Work Order Number: 14-07-1550

1	Work Order Narrative.	3
2	Client Sample Data.	4
	2.1 EPA 200.8 ICP/MS Metals (Aqueous).	4
3	Quality Control Sample Data.	5
	3.1 MS/MSD.	5
	3.2 PDS/PDSD.	6
	3.3 LCS/LCSD.	7
4	Sample Analysis Summary.	8
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6	Chain-of-Custody/Sample Receipt Form.	10

Work Order Narrative

Work Order: 14-07-1550

Page 1 of 1

Condition Upon Receipt:

Samples were received under Chain-of-Custody (COC) on 07/23/14. They were assigned to Work Order 14-07-1550.

Unless otherwise noted on the Sample Receiving forms all samples were received in good condition and within the recommended EPA temperature criteria for the methods noted on the COC. The COC and Sample Receiving Documents are integral elements of the analytical report and are presented at the back of the report.

Holding Times:

All samples were analyzed within prescribed holding times (HT) and/or in accordance with the Calscience Sample Acceptance Policy unless otherwise noted in the analytical report and/or comprehensive case narrative, if required.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of ≤ 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

Quality Control:

All quality control parameters (QC) were within established control limits except where noted in the QC summary forms or described further within this report.

Additional Comments:

Air - Sorbent-extracted air methods (EPA TO-4A, EPA TO-10, EPA TO-13A, EPA TO-17): Analytical results are converted from mass/sample basis to mass/volume basis using client-supplied air volumes.

New York NELAP air certification does not certify for all reported methods and analytes, reference the accredited items here: http://www.calscience.com/PDF/New_York.pdf

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are always reported on a wet weight basis.

Subcontractor Information:

Unless otherwise noted below (or on the subcontract form), no samples were subcontracted.



Calscience

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/23/14
Work Order: 14-07-1550
Preparation: N/A
Method: EPA 200.8
Units: ug/L

Project: Red Hill 112066

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES107UF	14-07-1550-5-A	07/22/14 09:45	Aqueous	ICP/MS 04	07/23/14	07/24/14 20:02	140723L02D

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Lead	<0.0898	1.00	0.0898	1.00	U

Method Blank	099-16-094-424	N/A	Aqueous	ICP/MS 03	07/23/14	07/23/14 15:02	140723L02D
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Lead	<0.0898	1.00	0.0898	1.00	U

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Quality Control - Spike/Spike Duplicate

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/23/14
Work Order: 14-07-1550
Preparation: N/A
Method: EPA 200.8

Project: Red Hill 112066

Page 1 of 1

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
14-07-1564-2	Sample	Aqueous	ICP/MS 03	07/23/14	07/23/14 15:15	140723S02
14-07-1564-2	Matrix Spike	Aqueous	ICP/MS 03	07/23/14	07/23/14 15:09	140723S02
14-07-1564-2	Matrix Spike Duplicate	Aqueous	ICP/MS 03	07/23/14	07/23/14 15:12	140723S02

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Lead	112.2	100.0	229.4	117	233.0	121	80-120	2	0-20	3

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - PDS

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/23/14
Work Order: 14-07-1550
Preparation: N/A
Method: EPA 200.8

Project: Red Hill 112066

Page 1 of 1

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	PDS/PDSD Batch Number
14-07-1564-2	Sample	Aqueous	ICP/MS 03	07/23/14 00:00	07/23/14 15:15	140723S02
14-07-1564-2	PDS	Aqueous	ICP/MS 03	07/23/14 00:00	07/29/14 14:31	140723S02
Parameter	Sample Conc.	Spike Added	PDS Conc.	PDS %Rec.	%Rec. CL	Qualifiers
Lead	112.2	500.0	640.9	106	75-125	

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/23/14
Work Order: 14-07-1550
Preparation: N/A
Method: EPA 200.8

Project: Red Hill 112066

Page 1 of 1

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-16-094-424	LCS	Aqueous	ICP/MS 03	07/23/14	07/23/14 15:05	140723L02D

<u>Parameter</u>	<u>Spike Added</u>	<u>Conc. Recovered</u>	<u>LCS %Rec.</u>	<u>%Rec. CL</u>	<u>Qualifiers</u>
Lead	100.0	95.43	95	80-120	

Return to Contents



Calscience

Sample Analysis Summary Report

Work Order: 14-07-1550

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<u>Method</u>	<u>Extraction</u>	<u>Chemist ID</u>	<u>Instrument</u>	<u>Analytical Location</u>
EPA 200.8	N/A	598	ICP/MS 04	1


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Location 1: 7440 Lincoln Way, Garden Grove, CA 92841

Glossary of Terms and Qualifiers

Work Order: 14-07-1550

Page 1 of 1

<u>Qualifiers</u>	<u>Definition</u>
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to suspected matrix interference. The associated LCS recovery was in control.
4	The MS/MSD RPD was out of control due to suspected matrix interference.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to suspected matrix interference.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
B	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
DL	The Detection Limit (DL) is the smallest analyte concentration that can be demonstrated to be different from zero or a blank concentration at the 99% level of confidence.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
ICH	Initial calibration verification recovery is above the control limit for this analyte.
ICJ	Initial calibration verification recovery is below the control limit for this analyte.
IH	Calibration verification recovery is above the control limit for this analyte.
IJ	Calibration verification recovery is below the control limit for this analyte.
J	Analyte was detected at a concentration below the LOQ and above the DL. Reported value is estimated.
JA	Analyte positively identified but quantitation is an estimate.
LOD	The Limit of Detection (LOD) is the smallest amount or concentration of a substance that must be present in a sample in order to be detected at 99% confidence level.
LOQ	The Limit of Quantitation (LOQ) is the lowest concentration of a substance that produces a quantitative result within specified limits of precision and bias.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
U	Undetected at Detection Limit (DL) and is reported as less than the Limit of Detection (LOD).
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.
	Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.
	Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of ≤ 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.
	A calculated total result (Example: Total Pesticides) is the summation of each component concentration and/or, if "J" flags are reported, estimated concentration. Component concentrations showing not detected (ND) are summed into the calculated total result as zero concentrations.



/ LAB USE ONLY
14-07-1550

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LABORATORY CLIENT: Environmental Science International	
ADDRESS: 354 Union St., Suite 304	
CITY: Fairluea	STATE: HI ZIP: 96734
TEL: 808-261-0740	E-MAIL: exchange@science-i.com, dfe@science-i.com
TURNAROUND TIME (Rush surcharges may apply to any TAT not "STANDARD"):	
<input type="checkbox"/> SAME DAY	<input type="checkbox"/> 24 HR <input type="checkbox"/> 48 HR <input type="checkbox"/> 72 HR <input type="checkbox"/> 5 DAYS <input checked="" type="checkbox"/> STANDARD
<input type="checkbox"/> COELT EDF	GLOBAL ID _____ LOG CODE _____

SPECIAL INSTRUCTIONS:

Regular (full) GW monitoring and byte list

[illegible]

Relinquished by: (Signature) <i>Jeff Mathews</i>	Received by: (Signature)
Relinquished by: (Signature)	Received by: (Signature)
Relinquished by: (Signature)	Received by: (Signature)

DISTRIBUTION: White with final report, Green and Yellow to Client. Please note that pages 1 and 2 of 2 of our T/Cs are printed on the re

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[illegible]

Richard Villafania

From: Ann Dang [ADang@esciencei.com]
Sent: Tuesday, July 22, 2014 6:34 PM
To: Richard Villafania
Cc: Domonkos Feher; Traci Sylva; Jeff Hattemer
Subject: 112066 Red Hill shipment 7-22-14
Attachments: COC 7-22-14.pdf

Hi Richard,

We shipped 2 coolers today, the FedEx tracking is 804557917397 and 780047104871.

For ES107UF, "field filtered" should not be marked. The correction was made on the attached COC.

Thanks,
Ann

Click [here](#) to report this email as spam.



Calscience Environmental Laboratories, Inc.
7440 Lincoln Way, Garden Grove, CA 92641-1427 • (714) 895-5494
Other locations: Concord, San Luis Obispo, Houston, and Corpus Christi
For courier service / sample drop off information,
contact sales@calscience.com or call us.

CHAIN OF CUSTODY RECORD

WO # / LAB USE ONLY
Date: 7/22/14 of 1
Page: 1

LABORATORY CLIENT: Environmental Science International
ADDRESS: 354 Lincoln St, Suite 304
CITY: Yakima STATE: WA ZIP: 98701
TEL: 808-261-0740 E-MAIL: ichangescience@es-international.com
TURNAROUND TIME (Rush surcharges may apply to any TAT not "STANDARD"):
☐ SAME DAY ☐ 24 HR ☐ 48 HR ☐ 72 HR ☒ STANDARD
☐ COELT EDF GLOBAL ID

CLIENT PROJECT NAME / NUMBER: Red Hill 12066
PROJECT CONTACT: Robert Chong
P.O. NO.:
SAMPLER(S) (PRINT): Just in bar, JAS 11/11/14

REQUESTED ANALYSES

Regular / Full / GW monitoring analytic list																								
LAB USE ONLY	SAMPLE ID	SAMPLING		MATRIX	NO. OF CONT.	Unpreserved	Preserved	Field Filtered	TPH(g) 8260 (8270)	TPH(d) 8260 (8270)	TPH □ C6-C36 □ C6-C44	TPH	BTEX / MTBE □ 8260 □	VOCs (8260)	Oxygenates (8260)	Prep (5035) □ En Core □ T	SVOCs (8270)	Pesticides (8081)	PCBs (8082)	PAHs □ 8270 8270 SIM	T22 Metals □ 6010/747X □	Cr(VI) □ 7196 □ 7199 □ 21	Lead (200.8)	Lead (200.8)
		DATE	TIME																					
	ES106	7/22/14	1120	water	10	X	X	X	X	X				X						X			X	X
	ES107	7/22/14	0945	water	9		X	X	X	X				X						X			X	X
	ES108	7/22/14	1035	water	10		X	X	X	X				X						X			X	X
	ES109	7/22/14	0800	water	3		X	X	X	X				X									X	X
	ES107UF	7/22/14	0945	water	1		X	X	X	X				X									X	X

Relinquished by: (Signature) [Signature] Received by: (Signature/Affiliation)
Relinquished by: (Signature) [Signature] Received by: (Signature/Affiliation)
Relinquished by: (Signature) [Signature] Received by: (Signature/Affiliation)

Calscience

WORK ORDER #: 14-07-1550

SAMPLE RECEIPT FORM

Cooler 1 of 2

CLIENT: Env Science

DATE: 07/23/14

TEMPERATURE: Thermometer ID: SC1 (Criteria: 0.0 °C – 6.0 °C, not frozen except sediment/tissue)

Temperature 2.6 °C - 0.3 °C (CF) = 2.3 °C ☒ Blank ☐ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by:)

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.

☐ Received at ambient temperature, placed on ice for transport by Courier.

Ambient Temperature: ☐ Air ☐ Filter

Checked by: 15

CUSTODY SEALS INTACT:

☒ Cooler ☐ ☐ No (Not Intact) ☐ Not Present ☐ N/A Checked by: 15

☒ Sample ☐ ☐ No (Not Intact) ☐ Not Present Checked by: 826

SAMPLE CONDITION:

	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COC document(s) received complete.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
<input type="checkbox"/> No analysis requested. <input type="checkbox"/> Not relinquished. <input type="checkbox"/> No date/time relinquished.			
Sampler's name indicated on COC.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample container label(s) consistent with COC.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample container(s) intact and good condition.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proper containers and sufficient volume for analyses requested.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Analyses received within holding time.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Aqueous samples received within 15-minute holding time			
<input type="checkbox"/> pH <input type="checkbox"/> Residual Chlorine <input type="checkbox"/> Dissolved Sulfides <input type="checkbox"/> Dissolved Oxygen.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Proper preservation noted on COC or sample container.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tedlar bag(s) free of condensation.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

CONTAINER TYPE:

Solid: ☐ 4ozCGJ ☐ 8ozCGJ ☐ 16ozCGJ ☐ Sleeve () ☐ EnCores® ☐ TerraCores® ☐

Aqueous: ☒ VOA ☒ VOAh ☐ VOAna2 ☐ 125AGB ☐ 125AGBh ☐ 125AGBp ☒ 1AGB ☐ 1AGBna2 ☐ 1AGBs

☐ 500AGB ☒ 500AGJ ☐ 500AGJs ☐ 250AGB ☐ 250CGB ☐ 250CGBs ☐ 1PB ☐ 1PBna ☐ 500PB

☐ 250PB ☒ 250PBna ☐ 125PB ☐ 125PBzanna ☐ 100PJ ☐ 100PJna ☐ ☐ ☐

Air: ☐ Tedlar® ☐ Canister Other: ☐ Trip Blank Lot#: 131007B Labeled/Checked by: 826

Container: C: Clear A: Amber P: Plastic G: Glass J: Jar B: Bottle Z: Ziploc/Resealable Bag E: Envelope Reviewed by: 776

Preservative: h: HCL n: HNO3 na2: Na2S2O3 na: NaOH p: H3PO4 s: H2SO4 u: Ultra-pure zanna: ZnAc2+NaOH f: Filtered Scanned by: 776

Calscience

WORK ORDER #: 14-07-1550

SAMPLE RECEIPT FORM

Cooler 2 of 2

CLIENT: Env. Science

DATE: 07/23/14

TEMPERATURE: Thermometer ID: SC1 (Criteria: 0.0 °C – 6.0 °C, not frozen except sediment/tissue)

Temperature 2.8 °C - 0.3 °C (CF) = 2.5 °C ☒ Blank ☐ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by:)

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.

☐ Received at ambient temperature, placed on ice for transport by Courier.

Ambient Temperature: ☐ Air ☐ Filter

Checked by: 15

CUSTODY SEALS INTACT:

☒ Cooler ☐ No (Not Intact) ☐ Not Present ☐ N/A Checked by: 15

☒ Sample ☐ No (Not Intact) ☐ Not Present Checked by: 8/16

SAMPLE CONDITION:

	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COC document(s) received complete.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
<input type="checkbox"/> No analysis requested. <input type="checkbox"/> Not relinquished. <input type="checkbox"/> No date/time relinquished.			
Sampler's name indicated on COC.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample container label(s) consistent with COC.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample container(s) intact and good condition.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proper containers and sufficient volume for analyses requested.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Analyses received within holding time.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Aqueous samples received within 15-minute holding time			
<input type="checkbox"/> pH <input type="checkbox"/> Residual Chlorine <input type="checkbox"/> Dissolved Sulfides <input type="checkbox"/> Dissolved Oxygen.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Proper preservation noted on COC or sample container.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tedlar bag(s) free of condensation.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

CONTAINER TYPE:

Solid: ☐ 4ozCGJ ☐ 8ozCGJ ☐ 16ozCGJ ☐ Sleeve () ☐ EnCores® ☐ TerraCores® ☐

Aqueous: ☒ VOA ☐ VOAh ☐ VOAna₂ ☐ 125AGB ☐ 125AGBh ☐ 125AGBp ☒ 1AGB ☐ 1AGBna₂ ☐ 1AGBs

☐ 500AGB ☒ 500AGJ ☐ 500AGJs ☐ 250AGB ☐ 250CGB ☐ 250CGBs ☐ 1PB ☐ 1PBna ☐ 500PB

☐ 250PB ☒ 250PBna ☐ 125PB ☐ 125PBznn ☐ 100PJ ☐ 100PJna₂ ☐ ☐ ☐

Air: ☐ Tedlar® ☐ Canister Other: ☐ Trip Blank Lot#: Labeled/Checked by: 8/16

Container: C: Clear A: Amber P: Plastic G: Glass J: Jar B: Bottle Z: Ziploc/Resealable Bag E: Envelope Reviewed by: 778

Preservative: h: HCL n: HNO₃ na₂: Na₂S₂O₃ na: NaOH p: H₃PO₄ s: H₂SO₄ u: Ultra-pure znn: ZnAc₂+NaOH f: Filtered Scanned by: 778



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Supplemental Report 2

The original report has been revised/corrected.



WORK ORDER NUMBER: 14-07-1550

The difference is service



AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For

Client: Environmental Science International, Inc.

Client Project Name: Red Hill 112066

Attention: Robert Chong
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Richard Villafania

Approved for release on 07/31/2014 by:
Richard Villafania
Project Manager

ResultLink ▶

Email your PM ▶



Eurofins Calscience, Inc. (Calscience) certifies that the test results provided in this report meet all NELAC requirements for parameters for which accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The original report of subcontracted analyses, if any, is attached to this report. The results in this report are limited to the sample(s) tested and any reproduction thereof must be made in its entirety. The client or recipient of this report is specifically prohibited from making material changes to said report and, to the extent that such changes are made, Calscience is not responsible, legally or otherwise. The client or recipient agrees to indemnify Calscience for any defense to any litigation which may arise.

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 Work Order Number: 14-07-1550

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Work Order Narrative

Work Order: 14-07-1550

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Condition Upon Receipt:

Samples were received under Chain-of-Custody (COC) on 07/23/14. They were assigned to Work Order 14-07-1550.

Unless otherwise noted on the Sample Receiving forms all samples were received in good condition and within the recommended EPA temperature criteria for the methods noted on the COC. The COC and Sample Receiving Documents are integral elements of the analytical report and are presented at the back of the report.

Holding Times:

All samples were analyzed within prescribed holding times (HT) and/or in accordance with the Calscience Sample Acceptance Policy unless otherwise noted in the analytical report and/or comprehensive case narrative, if required.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of ≤ 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

Quality Control:

All quality control parameters (QC) were within established control limits except where noted in the QC summary forms or described further within this report.

Additional Comments:

Air - Sorbent-extracted air methods (EPA TO-4A, EPA TO-10, EPA TO-13A, EPA TO-17): Analytical results are converted from mass/sample basis to mass/volume basis using client-supplied air volumes.

New York NELAP air certification does not certify for all reported methods and analytes, reference the accredited items here: http://www.calscience.com/PDF/New_York.pdf

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are always reported on a wet weight basis.

Subcontractor Information:

Unless otherwise noted below (or on the subcontract form), no samples were subcontracted.



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Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/23/14
Work Order: 14-07-1550
Preparation: EPA 3510C
Method: EPA 8015B (M)
Units: ug/L

Project: Red Hill LTM 112066

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES106	14-07-1550-1-H	07/22/14 11:20	Aqueous	GC 45	07/24/14	07/25/14 09:09	140724B11B

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.
- TPH as Diesel is quantified in the carbon range C10-C28.

<u>Parameter</u>	<u>Result</u>	<u>DL</u>	<u>LOD</u>	<u>LOQ</u>	<u>DF</u>	<u>Qualifiers</u>
TPH as Diesel	37	11	12	25	1.00	HD

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
n-Octacosane	91	51-141	

ES107	14-07-1550-2-G	07/22/14 09:45	Aqueous	GC 45	07/24/14	07/25/14 09:28	140724B11B
--------------	-----------------------	-----------------------	----------------	--------------	-----------------	-----------------------	-------------------

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.
- TPH as Diesel is quantified in the carbon range C10-C28.

<u>Parameter</u>	<u>Result</u>	<u>DL</u>	<u>LOD</u>	<u>LOQ</u>	<u>DF</u>	<u>Qualifiers</u>
TPH as Diesel	<12	11	12	25	1.00	U

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
n-Octacosane	92	51-141	

ES108	14-07-1550-3-H	07/22/14 10:35	Aqueous	GC 45	07/24/14	07/25/14 09:47	140724B11B
--------------	-----------------------	-----------------------	----------------	--------------	-----------------	-----------------------	-------------------

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.
- TPH as Diesel is quantified in the carbon range C10-C28.

<u>Parameter</u>	<u>Result</u>	<u>DL</u>	<u>LOD</u>	<u>LOQ</u>	<u>DF</u>	<u>Qualifiers</u>
TPH as Diesel	<12	11	12	25	1.00	U

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
n-Octacosane	100	51-141	

Method Blank	099-15-516-159	N/A	Aqueous	GC 45	07/24/14	07/25/14 03:30	140724B11B
---------------------	-----------------------	------------	----------------	--------------	-----------------	-----------------------	-------------------

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>DL</u>	<u>LOD</u>	<u>LOQ</u>	<u>DF</u>	<u>Qualifiers</u>
TPH as Diesel	<12	11	12	25	1.00	U

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
n-Octacosane	90	51-141	



Calscience

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/23/14
Work Order: 14-07-1550
Preparation: EPA 3005A Filt.
Method: EPA 6020
Units: ug/L

Project: Red Hill LTM 112066

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES106	14-07-1550-1-G	07/22/14 11:20	Aqueous	ICP/MS 04	07/23/14	07/24/14 19:53	140723L03D

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>DL</u>	<u>LOD</u>	<u>LOQ</u>	<u>DF</u>	<u>Qualifiers</u>
Lead	<0.200	0.0898	0.200	1.00	1.00	U

ES108	14-07-1550-3-G	07/22/14 10:35	Aqueous	ICP/MS 04	07/23/14	07/24/14 20:00	140723L03D
--------------	-----------------------	-----------------------	----------------	------------------	-----------------	-----------------------	-------------------

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>DL</u>	<u>LOD</u>	<u>LOQ</u>	<u>DF</u>	<u>Qualifiers</u>
Lead	<0.200	0.0898	0.200	1.00	1.00	U

Method Blank	099-14-497-87	N/A	Aqueous	ICP/MS 04	07/23/14	07/24/14 19:24	140723L03D
---------------------	----------------------	------------	----------------	------------------	-----------------	-----------------------	-------------------

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>DL</u>	<u>LOD</u>	<u>LOQ</u>	<u>DF</u>	<u>Qualifiers</u>
Lead	<0.200	0.0898	0.200	1.00	1.00	U

Return to Contents



Calscience

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/23/14
Work Order: 14-07-1550
Preparation: EPA 3510C
Method: EPA 8270C SIM PAHs
Units: ug/L

Project: Red Hill LTM 112066

Page 1 of 4

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES106	14-07-1550-1-J	07/22/14 11:20	Aqueous	GC/MS AAA	07/28/14	07/29/14 17:29	140728L01

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Naphthalene	<0.047	0.022	0.047	0.19	1.00	U
2-Methylnaphthalene	<0.047	0.025	0.047	0.19	1.00	U
1-Methylnaphthalene	<0.047	0.027	0.047	0.19	1.00	U
Acenaphthylene	<0.047	0.017	0.047	0.19	1.00	U
Acenaphthene	<0.047	0.020	0.047	0.19	1.00	U
Fluorene	<0.047	0.023	0.047	0.19	1.00	U
Phenanthrene	<0.047	0.029	0.047	0.19	1.00	U
Anthracene	<0.047	0.032	0.047	0.19	1.00	U
Fluoranthene	<0.047	0.026	0.047	0.19	1.00	U
Pyrene	<0.047	0.023	0.047	0.19	1.00	U
Benzo (a) Anthracene	<0.047	0.022	0.047	0.19	1.00	U
Chrysene	<0.047	0.018	0.047	0.19	1.00	U
Benzo (k) Fluoranthene	<0.047	0.022	0.047	0.19	1.00	U
Benzo (b) Fluoranthene	<0.047	0.024	0.047	0.19	1.00	U
Benzo (a) Pyrene	<0.047	0.034	0.047	0.19	1.00	U
Indeno (1,2,3-c,d) Pyrene	<0.047	0.021	0.047	0.19	1.00	U
Dibenz (a,h) Anthracene	<0.047	0.025	0.047	0.19	1.00	U
Benzo (g,h,i) Perylene	<0.047	0.021	0.047	0.19	1.00	U

Surrogate	Rec. (%)	Control Limits	Qualifiers
Nitrobenzene-d5	78	28-139	
2-Fluorobiphenyl	78	33-144	
p-Terphenyl-d14	78	23-160	

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Calscience

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/23/14
Work Order: 14-07-1550
Preparation: EPA 3510C
Method: EPA 8270C SIM PAHs
Units: ug/L

Project: Red Hill LTM 112066

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES107	14-07-1550-2-H	07/22/14 09:45	Aqueous	GC/MS AAA	07/28/14	07/29/14 17:53	140728L01

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Naphthalene	<0.048	0.022	0.048	0.19	1.00	U
2-Methylnaphthalene	<0.048	0.025	0.048	0.19	1.00	U
1-Methylnaphthalene	<0.048	0.027	0.048	0.19	1.00	U
Acenaphthylene	<0.048	0.017	0.048	0.19	1.00	U
Acenaphthene	<0.048	0.020	0.048	0.19	1.00	U
Fluorene	<0.048	0.023	0.048	0.19	1.00	U
Phenanthrene	<0.048	0.029	0.048	0.19	1.00	U
Anthracene	<0.048	0.033	0.048	0.19	1.00	U
Fluoranthene	<0.048	0.026	0.048	0.19	1.00	U
Pyrene	<0.048	0.024	0.048	0.19	1.00	U
Benzo (a) Anthracene	<0.048	0.023	0.048	0.19	1.00	U
Chrysene	<0.048	0.018	0.048	0.19	1.00	U
Benzo (k) Fluoranthene	<0.048	0.022	0.048	0.19	1.00	U
Benzo (b) Fluoranthene	<0.048	0.024	0.048	0.19	1.00	U
Benzo (a) Pyrene	<0.048	0.035	0.048	0.19	1.00	U
Indeno (1,2,3-c,d) Pyrene	<0.048	0.021	0.048	0.19	1.00	U
Dibenz (a,h) Anthracene	<0.048	0.026	0.048	0.19	1.00	U
Benzo (g,h,i) Perylene	<0.048	0.021	0.048	0.19	1.00	U

Surrogate	Rec. (%)	Control Limits	Qualifiers
Nitrobenzene-d5	73	28-139	
2-Fluorobiphenyl	76	33-144	
p-Terphenyl-d14	71	23-160	



Calscience

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/23/14
Work Order: 14-07-1550
Preparation: EPA 3510C
Method: EPA 8270C SIM PAHs
Units: ug/L

Project: Red Hill LTM 112066

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES108	14-07-1550-3-J	07/22/14 10:35	Aqueous	GC/MS AAA	07/28/14	07/29/14 18:18	140728L01

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>DL</u>	<u>LOD</u>	<u>LOQ</u>	<u>DF</u>	<u>Qualifiers</u>
Naphthalene	<0.049	0.023	0.049	0.20	1.00	U
2-Methylnaphthalene	<0.049	0.026	0.049	0.20	1.00	U
1-Methylnaphthalene	<0.049	0.028	0.049	0.20	1.00	U
Acenaphthylene	<0.049	0.018	0.049	0.20	1.00	U
Acenaphthene	<0.049	0.020	0.049	0.20	1.00	U
Fluorene	<0.049	0.024	0.049	0.20	1.00	U
Phenanthrene	<0.049	0.030	0.049	0.20	1.00	U
Anthracene	<0.049	0.034	0.049	0.20	1.00	U
Fluoranthene	<0.049	0.027	0.049	0.20	1.00	U
Pyrene	<0.049	0.024	0.049	0.20	1.00	U
Benzo (a) Anthracene	<0.049	0.023	0.049	0.20	1.00	U
Chrysene	<0.049	0.019	0.049	0.20	1.00	U
Benzo (k) Fluoranthene	<0.049	0.023	0.049	0.20	1.00	U
Benzo (b) Fluoranthene	<0.049	0.024	0.049	0.20	1.00	U
Benzo (a) Pyrene	<0.049	0.036	0.049	0.20	1.00	U
Indeno (1,2,3-c,d) Pyrene	<0.049	0.022	0.049	0.20	1.00	U
Dibenz (a,h) Anthracene	<0.049	0.026	0.049	0.20	1.00	U
Benzo (g,h,i) Perylene	<0.049	0.021	0.049	0.20	1.00	U

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
Nitrobenzene-d5	68	28-139	
2-Fluorobiphenyl	72	33-144	
p-Terphenyl-d14	64	23-160	

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Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/23/14
Work Order: 14-07-1550
Preparation: EPA 3510C
Method: EPA 8270C SIM PAHs
Units: ug/L

Project: Red Hill LTM 112066

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-15-148-52	N/A	Aqueous	GC/MS AAA	07/28/14	07/29/14 13:03	140728L01

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Naphthalene	<0.050	0.023	0.050	0.20	1.00	U
2-Methylnaphthalene	<0.050	0.026	0.050	0.20	1.00	U
1-Methylnaphthalene	<0.050	0.028	0.050	0.20	1.00	U
Acenaphthylene	<0.050	0.018	0.050	0.20	1.00	U
Acenaphthene	<0.050	0.021	0.050	0.20	1.00	U
Fluorene	<0.050	0.024	0.050	0.20	1.00	U
Phenanthrene	<0.050	0.031	0.050	0.20	1.00	U
Anthracene	<0.050	0.034	0.050	0.20	1.00	U
Fluoranthene	<0.050	0.027	0.050	0.20	1.00	U
Pyrene	<0.050	0.025	0.050	0.20	1.00	U
Benzo (a) Anthracene	<0.050	0.024	0.050	0.20	1.00	U
Chrysene	<0.050	0.019	0.050	0.20	1.00	U
Benzo (k) Fluoranthene	<0.050	0.023	0.050	0.20	1.00	U
Benzo (b) Fluoranthene	<0.050	0.025	0.050	0.20	1.00	U
Benzo (a) Pyrene	<0.050	0.036	0.050	0.20	1.00	U
Indeno (1,2,3-c,d) Pyrene	<0.050	0.022	0.050	0.20	1.00	U
Dibenz (a,h) Anthracene	<0.050	0.027	0.050	0.20	1.00	U
Benzo (g,h,i) Perylene	<0.050	0.022	0.050	0.20	1.00	U

Surrogate	Rec. (%)	Control Limits	Qualifiers
Nitrobenzene-d5	90	28-139	
2-Fluorobiphenyl	86	33-144	
p-Terphenyl-d14	87	23-160	

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Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/23/14
Work Order: 14-07-1550
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B
Units: ug/L

Project: Red Hill LTM 112066

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES106	14-07-1550-1-A	07/22/14 11:20	Aqueous	GC/MS OO	07/23/14	07/23/14 17:27	140723L017

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Acetone	<10	6.0	10	20	1.00	U,ICH
Benzene	<0.50	0.14	0.50	1.0	1.00	U
Bromodichloromethane	<0.50	0.21	0.50	5.0	1.00	U
Bromoform	<1.0	0.50	1.0	10	1.00	U
Bromomethane	<5.0	3.9	5.0	20	1.00	U
2-Butanone	<5.0	2.2	5.0	10	1.00	U
Carbon Tetrachloride	<0.50	0.23	0.50	1.0	1.00	U
Chlorobenzene	<0.50	0.17	0.50	5.0	1.00	U
Chloroethane	<5.0	2.3	5.0	10	1.00	U
Chloroform	<0.50	0.46	0.50	5.0	1.00	U
Chloromethane	<2.0	1.8	2.0	10	1.00	U,IJ
Dibromochloromethane	<0.50	0.25	0.50	1.0	1.00	U
1,2-Dibromo-3-Chloropropane	<2.0	1.2	2.0	10	1.00	U
1,2-Dibromoethane	<0.50	0.36	0.50	1.0	1.00	U
1,2-Dichlorobenzene	<0.50	0.46	0.50	1.0	1.00	U
1,3-Dichlorobenzene	<0.50	0.40	0.50	1.0	1.00	U
1,4-Dichlorobenzene	<0.50	0.43	0.50	1.0	1.00	U
1,1-Dichloroethane	<0.50	0.28	0.50	5.0	1.00	U
1,2-Dichloroethane	<0.50	0.24	0.50	1.0	1.00	U
1,1-Dichloroethene	<0.50	0.43	0.50	1.0	1.00	U
c-1,2-Dichloroethene	<0.50	0.48	0.50	1.0	1.00	U
t-1,2-Dichloroethene	<0.50	0.37	0.50	1.0	1.00	U
1,2-Dichloropropane	<0.50	0.42	0.50	5.0	1.00	U
c-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1.00	U
t-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1.00	U
Ethylbenzene	<0.50	0.14	0.50	1.0	1.00	U
Methylene Chloride	<1.0	0.64	1.0	5.0	1.00	U
4-Methyl-2-Pentanone	<5.0	4.4	5.0	10	1.00	U
Styrene	<0.50	0.17	0.50	1.0	1.00	U
1,1,1,2-Tetrachloroethane	<0.50	0.40	0.50	1.0	1.00	U
1,1,2,2-Tetrachloroethane	<0.50	0.41	0.50	1.0	1.00	U
Tetrachloroethene	<0.50	0.39	0.50	5.0	1.00	U
Toluene	<0.50	0.24	0.50	1.0	1.00	U
1,2,4-Trichlorobenzene	<1.0	0.50	1.0	5.0	1.00	U
1,1,1-Trichloroethane	<0.50	0.30	0.50	5.0	1.00	U
Hexachloro-1,3-Butadiene	<0.50	0.32	0.50	1.0	1.00	U

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Calscience

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/23/14
Work Order: 14-07-1550
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B
Units: ug/L

Project: Red Hill LTM 112066

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<u>Parameter</u>	<u>Result</u>	<u>DL</u>	<u>LOD</u>	<u>LOQ</u>	<u>DF</u>	<u>Qualifiers</u>
1,1,2-Trichloroethane	<0.50	0.38	0.50	1.0	1.00	U
Trichloroethene	<0.50	0.37	0.50	1.0	1.00	U
1,2,3-Trichloropropane	<1.0	0.64	1.0	5.0	1.00	U
Vinyl Chloride	<0.50	0.30	0.50	1.0	1.00	U
p/m-Xylene	<1.0	0.30	1.0	10	1.00	U
o-Xylene	<0.50	0.23	0.50	1.0	1.00	U
Methyl-t-Butyl Ether (MTBE)	<0.50	0.31	0.50	1.0	1.00	U
Gasoline Range Organics	<30	26	30	50	1.00	U

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
Dibromofluoromethane	97	80-126	
1,2-Dichloroethane-d4	90	80-134	
Toluene-d8	98	80-120	
Toluene-d8-TPPH	97	88-112	
1,4-Bromofluorobenzene	94	80-120	

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Calscience

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/23/14
Work Order: 14-07-1550
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B
Units: ug/L

Project: Red Hill LTM 112066

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES107	14-07-1550-2-A	07/22/14 09:45	Aqueous	GC/MS OO	07/23/14	07/23/14 21:31	140723L017

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Acetone	<10	6.0	10	20	1.00	U,ICH
Benzene	<0.50	0.14	0.50	1.0	1.00	U
Bromodichloromethane	<0.50	0.21	0.50	5.0	1.00	U
Bromoform	<1.0	0.50	1.0	10	1.00	U
Bromomethane	<5.0	3.9	5.0	20	1.00	U
2-Butanone	<5.0	2.2	5.0	10	1.00	U
Carbon Tetrachloride	<0.50	0.23	0.50	1.0	1.00	U
Chlorobenzene	<0.50	0.17	0.50	5.0	1.00	U
Chloroethane	<5.0	2.3	5.0	10	1.00	U
Chloroform	<0.50	0.46	0.50	5.0	1.00	U
Chloromethane	<2.0	1.8	2.0	10	1.00	U,IJ
Dibromochloromethane	<0.50	0.25	0.50	1.0	1.00	U
1,2-Dibromo-3-Chloropropane	<2.0	1.2	2.0	10	1.00	U
1,2-Dibromoethane	<0.50	0.36	0.50	1.0	1.00	U
1,2-Dichlorobenzene	<0.50	0.46	0.50	1.0	1.00	U
1,3-Dichlorobenzene	<0.50	0.40	0.50	1.0	1.00	U
1,4-Dichlorobenzene	<0.50	0.43	0.50	1.0	1.00	U
1,1-Dichloroethane	<0.50	0.28	0.50	5.0	1.00	U
1,2-Dichloroethane	<0.50	0.24	0.50	1.0	1.00	U
1,1-Dichloroethene	<0.50	0.43	0.50	1.0	1.00	U
c-1,2-Dichloroethene	<0.50	0.48	0.50	1.0	1.00	U
t-1,2-Dichloroethene	<0.50	0.37	0.50	1.0	1.00	U
1,2-Dichloropropane	<0.50	0.42	0.50	5.0	1.00	U
c-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1.00	U
t-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1.00	U
Ethylbenzene	<0.50	0.14	0.50	1.0	1.00	U
Methylene Chloride	<1.0	0.64	1.0	5.0	1.00	U
4-Methyl-2-Pentanone	<5.0	4.4	5.0	10	1.00	U
Styrene	<0.50	0.17	0.50	1.0	1.00	U
1,1,1,2-Tetrachloroethane	<0.50	0.40	0.50	1.0	1.00	U
1,1,2,2-Tetrachloroethane	<0.50	0.41	0.50	1.0	1.00	U
Tetrachloroethene	<0.50	0.39	0.50	5.0	1.00	U
Toluene	<0.50	0.24	0.50	1.0	1.00	U
1,2,4-Trichlorobenzene	<1.0	0.50	1.0	5.0	1.00	U
1,1,1-Trichloroethane	<0.50	0.30	0.50	5.0	1.00	U
Hexachloro-1,3-Butadiene	<0.50	0.32	0.50	1.0	1.00	U



Calscience

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/23/14
Work Order: 14-07-1550
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B
Units: ug/L

Project: Red Hill LTM 112066

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<u>Parameter</u>	<u>Result</u>	<u>DL</u>	<u>LOD</u>	<u>LOQ</u>	<u>DF</u>	<u>Qualifiers</u>
1,1,2-Trichloroethane	<0.50	0.38	0.50	1.0	1.00	U
Trichloroethene	<0.50	0.37	0.50	1.0	1.00	U
1,2,3-Trichloropropane	<1.0	0.64	1.0	5.0	1.00	U
Vinyl Chloride	<0.50	0.30	0.50	1.0	1.00	U
p/m-Xylene	<1.0	0.30	1.0	10	1.00	U
o-Xylene	<0.50	0.23	0.50	1.0	1.00	U
Methyl-t-Butyl Ether (MTBE)	<0.50	0.31	0.50	1.0	1.00	U
Gasoline Range Organics	<30	26	30	50	1.00	U

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
Dibromofluoromethane	98	80-126	
1,2-Dichloroethane-d4	94	80-134	
Toluene-d8	101	80-120	
Toluene-d8-TPPH	100	88-112	
1,4-Bromofluorobenzene	95	80-120	

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Calscience

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/23/14
Work Order: 14-07-1550
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B
Units: ug/L

Project: Red Hill LTM 112066

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES108	14-07-1550-3-A	07/22/14 10:35	Aqueous	GC/MS OO	07/23/14	07/23/14 21:58	140723L017

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Acetone	<10	6.0	10	20	1.00	U,ICH
Benzene	<0.50	0.14	0.50	1.0	1.00	U
Bromodichloromethane	<0.50	0.21	0.50	5.0	1.00	U
Bromoform	<1.0	0.50	1.0	10	1.00	U
Bromomethane	<5.0	3.9	5.0	20	1.00	U
2-Butanone	<5.0	2.2	5.0	10	1.00	U
Carbon Tetrachloride	<0.50	0.23	0.50	1.0	1.00	U
Chlorobenzene	<0.50	0.17	0.50	5.0	1.00	U
Chloroethane	<5.0	2.3	5.0	10	1.00	U
Chloroform	<0.50	0.46	0.50	5.0	1.00	U
Chloromethane	<2.0	1.8	2.0	10	1.00	U,IJ
Dibromochloromethane	<0.50	0.25	0.50	1.0	1.00	U
1,2-Dibromo-3-Chloropropane	<2.0	1.2	2.0	10	1.00	U
1,2-Dibromoethane	<0.50	0.36	0.50	1.0	1.00	U
1,2-Dichlorobenzene	<0.50	0.46	0.50	1.0	1.00	U
1,3-Dichlorobenzene	<0.50	0.40	0.50	1.0	1.00	U
1,4-Dichlorobenzene	<0.50	0.43	0.50	1.0	1.00	U
1,1-Dichloroethane	<0.50	0.28	0.50	5.0	1.00	U
1,2-Dichloroethane	<0.50	0.24	0.50	1.0	1.00	U
1,1-Dichloroethene	<0.50	0.43	0.50	1.0	1.00	U
c-1,2-Dichloroethene	<0.50	0.48	0.50	1.0	1.00	U
t-1,2-Dichloroethene	<0.50	0.37	0.50	1.0	1.00	U
1,2-Dichloropropane	<0.50	0.42	0.50	5.0	1.00	U
c-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1.00	U
t-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1.00	U
Ethylbenzene	<0.50	0.14	0.50	1.0	1.00	U
Methylene Chloride	<1.0	0.64	1.0	5.0	1.00	U
4-Methyl-2-Pentanone	<5.0	4.4	5.0	10	1.00	U
Styrene	<0.50	0.17	0.50	1.0	1.00	U
1,1,1,2-Tetrachloroethane	<0.50	0.40	0.50	1.0	1.00	U
1,1,2,2-Tetrachloroethane	<0.50	0.41	0.50	1.0	1.00	U
Tetrachloroethene	<0.50	0.39	0.50	5.0	1.00	U
Toluene	<0.50	0.24	0.50	1.0	1.00	U
1,2,4-Trichlorobenzene	<1.0	0.50	1.0	5.0	1.00	U
1,1,1-Trichloroethane	<0.50	0.30	0.50	5.0	1.00	U
Hexachloro-1,3-Butadiene	<0.50	0.32	0.50	1.0	1.00	U



Calscience

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/23/14
Work Order: 14-07-1550
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B
Units: ug/L

Project: Red Hill LTM 112066

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<u>Parameter</u>	<u>Result</u>	<u>DL</u>	<u>LOD</u>	<u>LOQ</u>	<u>DF</u>	<u>Qualifiers</u>
1,1,2-Trichloroethane	<0.50	0.38	0.50	1.0	1.00	U
Trichloroethene	<0.50	0.37	0.50	1.0	1.00	U
1,2,3-Trichloropropane	<1.0	0.64	1.0	5.0	1.00	U
Vinyl Chloride	<0.50	0.30	0.50	1.0	1.00	U
p/m-Xylene	<1.0	0.30	1.0	10	1.00	U
o-Xylene	<0.50	0.23	0.50	1.0	1.00	U
Methyl-t-Butyl Ether (MTBE)	<0.50	0.31	0.50	1.0	1.00	U
Gasoline Range Organics	<30	26	30	50	1.00	U

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
Dibromofluoromethane	98	80-126	
1,2-Dichloroethane-d4	92	80-134	
Toluene-d8	100	80-120	
Toluene-d8-TPPH	99	88-112	
1,4-Bromofluorobenzene	94	80-120	

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Calscience

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/23/14
Work Order: 14-07-1550
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B
Units: ug/L

Project: Red Hill LTM 112066

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES TRIP	14-07-1550-4-A	07/22/14 08:00	Aqueous	GC/MS OO	07/23/14	07/23/14 21:03	140723L017

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Acetone	<10	6.0	10	20	1.00	U,ICH
Benzene	<0.50	0.14	0.50	1.0	1.00	U
Bromodichloromethane	<0.50	0.21	0.50	5.0	1.00	U
Bromoform	<1.0	0.50	1.0	10	1.00	U
Bromomethane	<5.0	3.9	5.0	20	1.00	U
2-Butanone	<5.0	2.2	5.0	10	1.00	U
Carbon Tetrachloride	<0.50	0.23	0.50	1.0	1.00	U
Chlorobenzene	<0.50	0.17	0.50	5.0	1.00	U
Chloroethane	<5.0	2.3	5.0	10	1.00	U
Chloroform	<0.50	0.46	0.50	5.0	1.00	U
Chloromethane	<2.0	1.8	2.0	10	1.00	U,IJ
Dibromochloromethane	<0.50	0.25	0.50	1.0	1.00	U
1,2-Dibromo-3-Chloropropane	<2.0	1.2	2.0	10	1.00	U
1,2-Dibromoethane	<0.50	0.36	0.50	1.0	1.00	U
1,2-Dichlorobenzene	<0.50	0.46	0.50	1.0	1.00	U
1,3-Dichlorobenzene	<0.50	0.40	0.50	1.0	1.00	U
1,4-Dichlorobenzene	<0.50	0.43	0.50	1.0	1.00	U
1,1-Dichloroethane	<0.50	0.28	0.50	5.0	1.00	U
1,2-Dichloroethane	<0.50	0.24	0.50	1.0	1.00	U
1,1-Dichloroethene	<0.50	0.43	0.50	1.0	1.00	U
c-1,2-Dichloroethene	<0.50	0.48	0.50	1.0	1.00	U
t-1,2-Dichloroethene	<0.50	0.37	0.50	1.0	1.00	U
1,2-Dichloropropane	<0.50	0.42	0.50	5.0	1.00	U
c-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1.00	U
t-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1.00	U
Ethylbenzene	<0.50	0.14	0.50	1.0	1.00	U
Methylene Chloride	<1.0	0.64	1.0	5.0	1.00	U
4-Methyl-2-Pentanone	<5.0	4.4	5.0	10	1.00	U
Styrene	<0.50	0.17	0.50	1.0	1.00	U
1,1,1,2-Tetrachloroethane	<0.50	0.40	0.50	1.0	1.00	U
1,1,2,2-Tetrachloroethane	<0.50	0.41	0.50	1.0	1.00	U
Tetrachloroethene	<0.50	0.39	0.50	5.0	1.00	U
Toluene	<0.50	0.24	0.50	1.0	1.00	U
1,2,4-Trichlorobenzene	<1.0	0.50	1.0	5.0	1.00	U
1,1,1-Trichloroethane	<0.50	0.30	0.50	5.0	1.00	U
Hexachloro-1,3-Butadiene	<0.50	0.32	0.50	1.0	1.00	U

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Calscience

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/23/14
Work Order: 14-07-1550
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B
Units: ug/L

Project: Red Hill LTM 112066

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<u>Parameter</u>	<u>Result</u>	<u>DL</u>	<u>LOD</u>	<u>LOQ</u>	<u>DF</u>	<u>Qualifiers</u>
1,1,2-Trichloroethane	<0.50	0.38	0.50	1.0	1.00	U
Trichloroethene	<0.50	0.37	0.50	1.0	1.00	U
1,2,3-Trichloropropane	<1.0	0.64	1.0	5.0	1.00	U
Vinyl Chloride	<0.50	0.30	0.50	1.0	1.00	U
p/m-Xylene	<1.0	0.30	1.0	10	1.00	U
o-Xylene	<0.50	0.23	0.50	1.0	1.00	U
Methyl-t-Butyl Ether (MTBE)	<0.50	0.31	0.50	1.0	1.00	U
Gasoline Range Organics	<30	26	30	50	1.00	U

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
Dibromofluoromethane	98	80-126	
1,2-Dichloroethane-d4	93	80-134	
Toluene-d8	100	80-120	
Toluene-d8-TPPH	99	88-112	
1,4-Bromofluorobenzene	94	80-120	

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Calscience

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/23/14
Work Order: 14-07-1550
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B
Units: ug/L

Project: Red Hill LTM 112066

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-13-057-58	N/A	Aqueous	GC/MS OO	07/23/14	07/23/14 16:50	140723L017

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Acetone	<10	6.0	10	20	1.00	U
Benzene	<0.50	0.14	0.50	1.0	1.00	U
Bromodichloromethane	<0.50	0.21	0.50	5.0	1.00	U
Bromoform	<1.0	0.50	1.0	10	1.00	U
Bromomethane	<5.0	3.9	5.0	20	1.00	U
2-Butanone	<5.0	2.2	5.0	10	1.00	U
Carbon Tetrachloride	<0.50	0.23	0.50	1.0	1.00	U
Chlorobenzene	<0.50	0.17	0.50	5.0	1.00	U
Chloroethane	<5.0	2.3	5.0	10	1.00	U
Chloroform	<0.50	0.46	0.50	5.0	1.00	U
Chloromethane	<2.0	1.8	2.0	10	1.00	U
Dibromochloromethane	<0.50	0.25	0.50	1.0	1.00	U
1,2-Dibromo-3-Chloropropane	<2.0	1.2	2.0	10	1.00	U
1,2-Dibromoethane	<0.50	0.36	0.50	1.0	1.00	U
1,2-Dichlorobenzene	<0.50	0.46	0.50	1.0	1.00	U
1,3-Dichlorobenzene	<0.50	0.40	0.50	1.0	1.00	U
1,4-Dichlorobenzene	<0.50	0.43	0.50	1.0	1.00	U
1,1-Dichloroethane	<0.50	0.28	0.50	5.0	1.00	U
1,2-Dichloroethane	<0.50	0.24	0.50	1.0	1.00	U
1,1-Dichloroethene	<0.50	0.43	0.50	1.0	1.00	U
c-1,2-Dichloroethene	<0.50	0.48	0.50	1.0	1.00	U
t-1,2-Dichloroethene	<0.50	0.37	0.50	1.0	1.00	U
1,2-Dichloropropane	<0.50	0.42	0.50	5.0	1.00	U
c-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1.00	U
t-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1.00	U
Ethylbenzene	<0.50	0.14	0.50	1.0	1.00	U
Methylene Chloride	<1.0	0.64	1.0	5.0	1.00	U
4-Methyl-2-Pentanone	<5.0	4.4	5.0	10	1.00	U
Styrene	<0.50	0.17	0.50	1.0	1.00	U
1,1,1,2-Tetrachloroethane	<0.50	0.40	0.50	1.0	1.00	U
1,1,2,2-Tetrachloroethane	<0.50	0.41	0.50	1.0	1.00	U
Tetrachloroethene	<0.50	0.39	0.50	5.0	1.00	U
Toluene	<0.50	0.24	0.50	1.0	1.00	U
1,2,4-Trichlorobenzene	<1.0	0.50	1.0	5.0	1.00	U
1,1,1-Trichloroethane	<0.50	0.30	0.50	5.0	1.00	U
Hexachloro-1,3-Butadiene	<0.50	0.32	0.50	1.0	1.00	U

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Calscience

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/23/14
Work Order: 14-07-1550
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B
Units: ug/L

Project: Red Hill LTM 112066

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<u>Parameter</u>	<u>Result</u>	<u>DL</u>	<u>LOD</u>	<u>LOQ</u>	<u>DF</u>	<u>Qualifiers</u>
1,1,2-Trichloroethane	<0.50	0.38	0.50	1.0	1.00	U
Trichloroethene	<0.50	0.37	0.50	1.0	1.00	U
1,2,3-Trichloropropane	<1.0	0.64	1.0	5.0	1.00	U
Vinyl Chloride	<0.50	0.30	0.50	1.0	1.00	U
p/m-Xylene	<1.0	0.30	1.0	10	1.00	U
o-Xylene	<0.50	0.23	0.50	1.0	1.00	U
Methyl-t-Butyl Ether (MTBE)	<0.50	0.31	0.50	1.0	1.00	U
Gasoline Range Organics	<30	26	30	50	1.00	U

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
Dibromofluoromethane	97	80-126	
1,2-Dichloroethane-d4	90	80-134	
Toluene-d8	99	80-120	
Toluene-d8-TPPH	98	88-112	
1,4-Bromofluorobenzene	95	80-120	

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Calscience

Quality Control - Spike/Spike Duplicate

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/23/14
Work Order: 14-07-1550
Preparation: EPA 3005A Filt.
Method: EPA 6020

Project: Red Hill LTM 112066

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number				
14-07-1466-2	Sample	Aqueous	ICP/MS 04	07/23/14	07/24/14 19:48	140723S03				
14-07-1466-2	Matrix Spike	Aqueous	ICP/MS 04	07/23/14	07/24/14 19:39	140723S03				
14-07-1466-2	Matrix Spike Duplicate	Aqueous	ICP/MS 04	07/23/14	07/24/14 19:41	140723S03				
Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Lead	ND	100.0	105.9	106	112.8	113	80-120	6	0-20	

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RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - Spike/Spike Duplicate

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/23/14
Work Order: 14-07-1550
Preparation: EPA 3510C
Method: EPA 8270C SIM PAHs

Project: Red Hill LTM 112066

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number				
14-07-1466-2	Sample	Aqueous	GC/MS AAA	07/28/14	07/29/14 21:31	140728S01				
14-07-1466-2	Matrix Spike	Aqueous	GC/MS AAA	07/28/14	07/29/14 13:52	140728S01				
14-07-1466-2	Matrix Spike Duplicate	Aqueous	GC/MS AAA	07/28/14	07/29/14 14:16	140728S01				
Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Naphthalene	70.83	2.000	59.97	0	64.80	0	21-133	8	0-25	3
2-Methylnaphthalene	19.64	2.000	21.30	83	18.58	0	21-140	14	0-25	3
1-Methylnaphthalene	25.19	2.000	25.26	4	24.73	0	20-140	2	0-25	3
Acenaphthylene	ND	2.000	1.370	68	1.495	75	33-145	9	0-25	
Acenaphthene	0.5154	2.000	1.776	63	1.936	71	49-121	9	0-25	
Fluorene	0.2363	2.000	1.536	65	1.689	73	59-121	10	0-25	
Phenanthrene	ND	2.000	1.313	66	1.517	76	54-120	14	0-25	
Anthracene	ND	2.000	1.421	71	1.551	78	27-133	9	0-25	
Fluoranthene	ND	2.000	1.282	64	1.431	72	26-137	11	0-25	
Pyrene	ND	2.000	1.192	60	1.344	67	18-168	12	0-25	
Benzo (a) Anthracene	ND	2.000	1.252	63	1.416	71	33-143	12	0-25	
Chrysene	ND	2.000	1.298	65	1.459	73	17-168	12	0-25	
Benzo (k) Fluoranthene	ND	2.000	1.137	57	1.284	64	24-159	12	0-25	
Benzo (b) Fluoranthene	ND	2.000	1.117	56	1.282	64	24-159	14	0-25	
Benzo (a) Pyrene	ND	2.000	1.181	59	1.348	67	17-163	13	0-25	
Indeno (1,2,3-c,d) Pyrene	ND	2.000	1.190	60	1.329	66	10-171	11	0-25	
Dibenz (a,h) Anthracene	ND	2.000	1.195	60	1.342	67	10-219	12	0-25	
Benzo (g,h,i) Perylene	ND	2.000	1.252	63	1.389	69	10-227	10	0-25	

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RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - Spike/Spike Duplicate

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/23/14
Work Order: 14-07-1550
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B

Project: Red Hill LTM 112066

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
ES106	Sample	Aqueous	GC/MS OO	07/23/14	07/23/14 17:27	140723S011
ES106	Matrix Spike	Aqueous	GC/MS OO	07/23/14	07/23/14 17:54	140723S011
ES106	Matrix Spike Duplicate	Aqueous	GC/MS OO	07/23/14	07/23/14 18:21	140723S011

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Acetone	ND	50.00	78.70	157	77.59	155	40-140	1	0-20	3
Benzene	ND	50.00	48.76	98	48.22	96	80-120	1	0-20	
Bromodichloromethane	ND	50.00	50.15	100	49.50	99	75-120	1	0-20	
Bromoform	ND	50.00	49.49	99	49.74	99	70-130	0	0-20	
Bromomethane	ND	50.00	48.54	97	44.16	88	30-145	9	0-20	
2-Butanone	ND	50.00	54.78	110	56.44	113	30-150	3	0-20	
Carbon Tetrachloride	ND	50.00	46.25	93	46.61	93	65-140	1	0-20	
Chlorobenzene	ND	50.00	50.80	102	49.94	100	80-120	2	0-20	
Chloroethane	ND	50.00	45.52	91	45.22	90	60-135	1	0-20	
Chloroform	ND	50.00	47.61	95	48.02	96	65-135	1	0-20	
Chloromethane	ND	50.00	41.38	83	41.46	83	40-125	0	0-20	
Dibromochloromethane	ND	50.00	50.97	102	51.09	102	60-135	0	0-20	
1,2-Dibromo-3-Chloropropane	ND	50.00	44.26	89	45.26	91	50-130	2	0-20	
1,2-Dibromoethane	ND	50.00	47.58	95	48.04	96	80-120	1	0-20	
1,2-Dichlorobenzene	ND	50.00	50.78	102	50.89	102	70-120	0	0-20	
1,3-Dichlorobenzene	ND	50.00	51.60	103	51.41	103	75-125	0	0-20	
1,4-Dichlorobenzene	ND	50.00	49.19	98	48.80	98	75-125	1	0-20	
1,1-Dichloroethane	ND	50.00	46.01	92	46.85	94	70-135	2	0-20	
1,2-Dichloroethane	ND	50.00	46.31	93	45.80	92	70-130	1	0-20	
1,1-Dichloroethene	ND	50.00	46.79	94	47.20	94	70-130	1	0-20	
c-1,2-Dichloroethene	ND	50.00	52.45	105	52.99	106	70-125	1	0-20	
t-1,2-Dichloroethene	ND	50.00	49.97	100	50.27	101	60-140	1	0-20	
1,2-Dichloropropane	ND	50.00	49.22	98	48.61	97	75-125	1	0-20	
c-1,3-Dichloropropene	ND	50.00	52.35	105	51.96	104	70-130	1	0-20	
t-1,3-Dichloropropene	ND	50.00	51.06	102	50.54	101	55-140	1	0-20	
Ethylbenzene	ND	50.00	49.48	99	49.20	98	75-125	1	0-20	
Methylene Chloride	ND	50.00	50.57	101	50.66	101	55-140	0	0-20	
4-Methyl-2-Pentanone	ND	50.00	48.94	98	50.04	100	60-135	2	0-20	
Styrene	ND	50.00	51.02	102	50.70	101	65-135	1	0-20	
1,1,1,2-Tetrachloroethane	ND	50.00	47.91	96	47.87	96	80-130	0	0-20	
1,1,2,2-Tetrachloroethane	ND	50.00	52.31	105	53.33	107	65-130	2	0-20	
Tetrachloroethene	ND	50.00	44.59	89	43.31	87	45-150	3	0-20	
Toluene	ND	50.00	48.57	97	48.18	96	75-120	1	0-20	
1,2,4-Trichlorobenzene	ND	50.00	49.23	98	49.82	100	65-135	1	0-20	
1,1,1-Trichloroethane	ND	50.00	45.95	92	46.57	93	65-130	1	0-20	

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - Spike/Spike Duplicate

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/23/14
Work Order: 14-07-1550
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B

Project: Red Hill LTM 112066

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<u>Parameter</u>	<u>Sample Conc.</u>	<u>Spike Added</u>	<u>MS Conc.</u>	<u>MS %Rec.</u>	<u>MSD Conc.</u>	<u>MSD %Rec.</u>	<u>%Rec. CL</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
Hexachloro-1,3-Butadiene	ND	50.00	46.15	92	46.43	93	50-140	1	0-20	
1,1,2-Trichloroethane	ND	50.00	50.04	100	49.56	99	75-125	1	0-20	
Trichloroethene	ND	50.00	48.06	96	47.51	95	70-125	1	0-20	
1,2,3-Trichloropropane	ND	50.00	47.27	95	47.63	95	75-125	1	0-20	
Vinyl Chloride	ND	50.00	45.23	90	44.53	89	50-145	2	0-20	
p/m-Xylene	ND	100.0	98.81	99	97.46	97	75-130	1	0-20	
o-Xylene	ND	50.00	51.41	103	51.11	102	80-120	1	0-20	
Methyl-t-Butyl Ether (MTBE)	ND	50.00	45.34	91	46.70	93	65-125	3	0-20	

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - PDS

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/23/14
Work Order: 14-07-1550
Preparation: EPA 3005A Filt.
Method: EPA 6020

Project: Red Hill LTM 112066

Page 1 of 1

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	PDS/PDSD Batch Number
14-07-1466-2	Sample	Aqueous	ICP/MS 04	07/23/14 00:00	07/24/14 19:48	140723S03
14-07-1466-2	PDS	Aqueous	ICP/MS 04	07/23/14 00:00	07/24/14 19:43	140723S03
Parameter	Sample Conc.	Spike Added	PDS Conc.	PDS %Rec.	%Rec. CL	Qualifiers
Lead	ND	100.0	102.3	102	75-125	

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS/LCSD

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/23/14
Work Order: 14-07-1550
Preparation: EPA 3510C
Method: EPA 8015B (M)

Project: Red Hill LTM 112066

Page 1 of 5

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number			
099-15-516-159	LCS	Aqueous	GC 45	07/24/14	07/25/14 03:49	140724B11B			
099-15-516-159	LCSD	Aqueous	GC 45	07/24/14	07/25/14 04:08	140724B11B			
Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
TPH as Diesel	2000	2008	100	2003	100	60-132	0	0-11	

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RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/23/14
Work Order: 14-07-1550
Preparation: EPA 3005A Filt.
Method: EPA 6020

Project: Red Hill LTM 112066

Page 2 of 5

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-14-497-87	LCS	Aqueous	ICP/MS 04	07/23/14	07/24/14 19:32	140723L03D

<u>Parameter</u>	<u>Spike Added</u>	<u>Conc. Recovered</u>	<u>LCS %Rec.</u>	<u>%Rec. CL</u>	<u>Qualifiers</u>
Lead	100.0	91.75	92	80-120	

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Calscience

Quality Control - LCS

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/23/14
Work Order: 14-07-1550
Preparation: EPA 3510C
Method: EPA 8270C SIM PAHs

Project: Red Hill LTM 112066

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-15-148-52	LCS	Aqueous	GC/MS AAA	07/28/14	07/29/14 13:28	140728L01
Parameter		Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	Qualifiers
Naphthalene		2.000	1.361	68	21-133	
2-Methylnaphthalene		2.000	1.230	61	21-140	
1-Methylnaphthalene		2.000	1.226	61	20-140	
Acenaphthylene		2.000	1.167	58	33-145	
Acenaphthene		2.000	1.271	64	55-121	
Fluorene		2.000	1.315	66	59-121	
Phenanthrene		2.000	1.379	69	54-120	
Anthracene		2.000	1.393	70	27-133	
Fluoranthene		2.000	1.385	69	26-137	
Pyrene		2.000	1.333	67	45-129	
Benzo (a) Anthracene		2.000	1.343	67	33-143	
Chrysene		2.000	1.447	72	17-168	
Benzo (k) Fluoranthene		2.000	1.265	63	24-159	
Benzo (b) Fluoranthene		2.000	1.294	65	24-159	
Benzo (a) Pyrene		2.000	1.273	64	17-163	
Indeno (1,2,3-c,d) Pyrene		2.000	1.408	70	25-175	
Dibenz (a,h) Anthracene		2.000	1.350	67	25-175	
Benzo (g,h,i) Perylene		2.000	1.500	75	25-157	

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RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS/LCSD

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/23/14
Work Order: 14-07-1550
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B

Project: Red Hill LTM 112066

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-13-057-58	LCS	Aqueous	GC/MS OO	07/23/14	07/23/14 15:27	140723L017
099-13-057-58	LCSD	Aqueous	GC/MS OO	07/23/14	07/23/14 15:54	140723L017

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Acetone	50.00	76.54	153	N/A	N/A	40-140	N/A	0-20	X
Benzene	50.00	48.59	97	N/A	N/A	80-120	N/A	0-20	
Bromodichloromethane	50.00	50.08	100	N/A	N/A	75-120	N/A	0-20	
Bromoform	50.00	50.09	100	N/A	N/A	70-130	N/A	0-20	
Bromomethane	50.00	46.74	93	N/A	N/A	30-145	N/A	0-20	
2-Butanone	50.00	56.87	114	N/A	N/A	30-150	N/A	0-20	
Carbon Tetrachloride	50.00	46.09	92	N/A	N/A	65-140	N/A	0-20	
Chlorobenzene	50.00	51.12	102	N/A	N/A	80-120	N/A	0-20	
Chloroethane	50.00	44.84	90	N/A	N/A	60-135	N/A	0-20	
Chloroform	50.00	48.48	97	N/A	N/A	65-135	N/A	0-20	
Chloromethane	50.00	41.19	82	N/A	N/A	40-125	N/A	0-20	
Dibromochloromethane	50.00	52.03	104	N/A	N/A	60-135	N/A	0-20	
1,2-Dibromo-3-Chloropropane	50.00	45.40	91	N/A	N/A	50-130	N/A	0-20	
1,2-Dibromoethane	50.00	48.92	98	N/A	N/A	80-120	N/A	0-20	
1,2-Dichlorobenzene	50.00	51.03	102	N/A	N/A	70-120	N/A	0-20	
1,3-Dichlorobenzene	50.00	51.52	103	N/A	N/A	75-125	N/A	0-20	
1,4-Dichlorobenzene	50.00	48.28	97	N/A	N/A	75-125	N/A	0-20	
1,1-Dichloroethane	50.00	47.01	94	N/A	N/A	70-135	N/A	0-20	
1,2-Dichloroethane	50.00	46.72	93	N/A	N/A	70-130	N/A	0-20	
1,1-Dichloroethene	50.00	47.70	95	N/A	N/A	70-130	N/A	0-20	
c-1,2-Dichloroethene	50.00	53.05	106	N/A	N/A	70-125	N/A	0-20	
t-1,2-Dichloroethene	50.00	51.14	102	N/A	N/A	60-140	N/A	0-20	
1,2-Dichloropropane	50.00	49.85	100	N/A	N/A	75-125	N/A	0-20	
c-1,3-Dichloropropene	50.00	52.80	106	N/A	N/A	70-130	N/A	0-20	
t-1,3-Dichloropropene	50.00	51.91	104	N/A	N/A	55-140	N/A	0-20	
Ethylbenzene	50.00	49.38	99	N/A	N/A	75-125	N/A	0-20	
Methylene Chloride	50.00	51.00	102	N/A	N/A	55-140	N/A	0-20	
4-Methyl-2-Pentanone	50.00	50.30	101	N/A	N/A	60-135	N/A	0-20	
Styrene	50.00	51.16	102	N/A	N/A	65-135	N/A	0-20	
1,1,1,2-Tetrachloroethane	50.00	48.31	97	N/A	N/A	80-130	N/A	0-20	
1,1,2,2-Tetrachloroethane	50.00	50.35	101	N/A	N/A	65-130	N/A	0-20	
Tetrachloroethene	50.00	49.33	99	N/A	N/A	45-150	N/A	0-20	
Toluene	50.00	48.73	97	N/A	N/A	75-120	N/A	0-20	
1,2,4-Trichlorobenzene	50.00	49.14	98	N/A	N/A	65-135	N/A	0-20	
1,1,1-Trichloroethane	50.00	46.95	94	N/A	N/A	65-130	N/A	0-20	
Hexachloro-1,3-Butadiene	50.00	46.63	93	N/A	N/A	50-140	N/A	0-20	

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS/LCSD

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/23/14
Work Order: 14-07-1550
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B

Project: Red Hill LTM 112066

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<u>Parameter</u>	<u>Spike Added</u>	<u>LCS Conc.</u>	<u>LCS %Rec.</u>	<u>LCSD Conc.</u>	<u>LCSD %Rec.</u>	<u>%Rec. CL</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
1,1,2-Trichloroethane	50.00	50.31	101	N/A	N/A	75-125	N/A	0-20	
Trichloroethene	50.00	49.97	100	N/A	N/A	70-125	N/A	0-20	
1,2,3-Trichloropropane	50.00	48.66	97	N/A	N/A	75-125	N/A	0-20	
Vinyl Chloride	50.00	45.04	90	N/A	N/A	50-145	N/A	0-20	
p/m-Xylene	100.0	98.26	98	N/A	N/A	75-130	N/A	0-20	
o-Xylene	50.00	51.86	104	N/A	N/A	80-120	N/A	0-20	
Methyl-t-Butyl Ether (MTBE)	50.00	47.49	95	N/A	N/A	65-125	N/A	0-20	
Gasoline Range Organics	1000	1017	102	1007	101	80-120	1	0-20	

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RPD: Relative Percent Difference. CL: Control Limits

Sample Analysis Summary Report

Work Order: 14-07-1550

Page 1 of 1

<u>Method</u>	<u>Extraction</u>	<u>Chemist ID</u>	<u>Instrument</u>	<u>Analytical Location</u>
EPA 6020	EPA 3005A Filt.	598	ICP/MS 04	1
EPA 8015B (M)	EPA 3510C	628	GC 45	1
EPA 8270C SIM PAHs	EPA 3510C	923	GC/MS AAA	1
GC/MS / EPA 8260B	EPA 5030C	849	GC/MS OO	2


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Location 1: 7440 Lincoln Way, Garden Grove, CA 92841

Location 2: 7445 Lampson Avenue, Garden Grove, CA 92841

Glossary of Terms and Qualifiers

Work Order: 14-07-1550

Page 1 of 1

Qualifiers	Definition
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to suspected matrix interference. The associated LCS recovery was in control.
4	The MS/MSD RPD was out of control due to suspected matrix interference.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to suspected matrix interference.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
B	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
DL	The Detection Limit (DL) is the smallest analyte concentration that can be demonstrated to be different from zero or a blank concentration at the 99% level of confidence.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
ICH	Initial calibration verification recovery is above the control limit for this analyte.
ICJ	Initial calibration verification recovery is below the control limit for this analyte.
IH	Calibration verification recovery is above the control limit for this analyte.
IJ	Calibration verification recovery is below the control limit for this analyte.
J	Analyte was detected at a concentration below the LOQ and above the DL. Reported value is estimated.
JA	Analyte positively identified but quantitation is an estimate.
LOD	The Limit of Detection (LOD) is the smallest amount or concentration of a substance that must be present in a sample in order to be detected at 99% confidence level.
LOQ	The Limit of Quantitation (LOQ) is the lowest concentration of a substance that produces a quantitative result within specified limits of precision and bias.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
U	Undetected at Detection Limit (DL) and is reported as less than the Limit of Detection (LOD).
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.
	Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.
	Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of ≤ 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.
	A calculated total result (Example: Total Pesticides) is the summation of each component concentration and/or, if "J" flags are reported, estimated concentration. Component concentrations showing not detected (ND) are summed into the calculated total result as zero concentrations.

[illegible][illegible]

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re/Affiliation)	<div> <div>Date: 7/22/14</div> <div>Time: 1200</div> </div>
re/Affiliation)	<div> <div>Date:</div> <div>Time:</div> </div>
re/Affiliation)	<div> <div>Date: 7/23/14</div> <div>Time: 0925</div> </div>

Richard Villafania

From: Ann Dang [ADang@esciencei.com]
Sent: Tuesday, July 22, 2014 6:34 PM
To: Richard Villafania
Cc: Domonkos Feher; Traci Sylva; Jeff Hattemer
Subject: 112066 Red Hill shipment 7-22-14
Attachments: COC 7-22-14.pdf

Hi Richard,

We shipped 2 coolers today, the FedEx tracking is 804557917397 and 780047104871.

For ES107UF, "field filtered" should not be marked. The correction was made on the attached COC.

Thanks,
Ann

Click [here](#) to report this email as spam.



Calscience Environmental Laboratories, Inc.
7440 Lincoln Way, Garden Grove, CA 92641-1427 • (714) 895-5494
Other locations: Concord, San Luis Obispo, Houston, and Corpus Christi
For courier service / sample drop off information,
contact sales@calscience.com or call us.

CHAIN OF CUSTODY RECORD

WO # / LAB USE ONLY _____ Date 7/22/14 of _____
Page _____

LABORATORY CLIENT: Environmental Science International
ADDRESS: 354 Lincoln St, Suite 304
CITY: Yakima STATE: WA ZIP: 98701
TEL: 808-261-0740 E-MAIL: ichangescience@es-intl.com
TURNAROUND TIME (Rush surcharges may apply to any TAT not "STANDARD"):
☐ SAME DAY ☐ 24 HR ☐ 48 HR ☐ 72 HR ☒ STANDARD
☐ COELT EDF GLOBAL ID _____
SPECIAL INSTRUCTIONS: Regular (full) GW monitoring analytic list

CLIENT PROJECT NAME / NUMBER: Red Hill 12066 P.O. NO.: _____
PROJECT CONTACT: Robert Chong SAMPLER(S) (PRINT): Justin Lee, JAS
REQUESTED ANALYSES
Please check box or fill in blank as needed.

LAB USE ONLY	SAMPLE ID	SAMPLING DATE	TIME	MATRIX	NO. OF CONT.	Unpreserved	Preserved	Field Filtered	TPH	TPH □ C6-C36 □ C6-C44	BTEX / MTBE □ 8260 □	VOCs (8260)	Oxygenates (8260)	Prep (5035) □ En Core □ Terra Core	SVOCS (8270)	Pesticides (8081)	PCBs (8082)	PAHs □ 8270 □ 8270 SIM	T22 Metals □ 6010/747X □ 6020/747X	Cr(VI) □ 7196 □ 7199 □ 218.6
	ES106	7/22/14	1120	water	10		X	X		X		X						X		Lead (200.8)
	ES107	7/22/14	0945	water	9	X						X						X		Lead (1620)
	ES108	7/22/14	1035	water	10		X	X		X		X						X		(H)
	ES109	7/22/14	0800	water	3		X					X								
	ES107UF	7/22/14	0945	water	1	X						X								X

Relinquished by: (Signature) [Signature] Received by: (Signature/Affiliation) _____ Date: 7/22/14 Time: 1200
Relinquished by: (Signature) _____ Received by: (Signature/Affiliation) _____ Date: _____ Time: _____
Relinquished by: (Signature) _____ Received by: (Signature/Affiliation) _____ Date: _____ Time: _____

1550

ORIGIN ID:HNLA (808) 261-0740
ESI

354 ULUNIU ST STE 304

KAILUA, HI 967342532
UNITED STATES US

SHIP DATE: 22JUL14
ACTWGT: 48.0 LB
CAD: /POS1501
DIMS: 24x13x13 IN

BILL SENDER

TO **SAMPLE CONTROL**
CAL SCIENCE
7440 LINCOLN WAY

GARDEN GROVE CA 92841

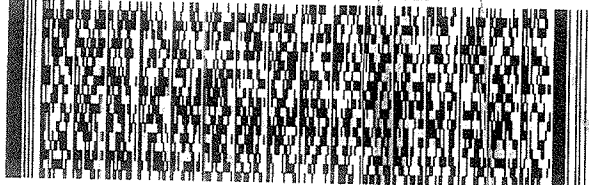
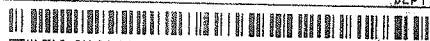
(714) 895-5494

REF:

INU:

PO:

DEPT:



1 of 2

TRK# 8045 5791 7397

MASTER

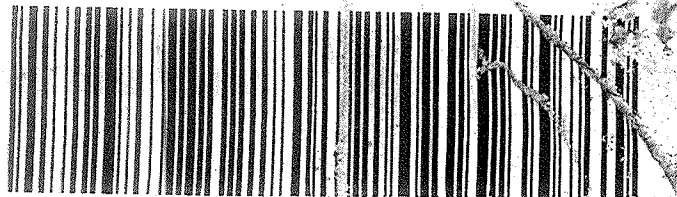
WZ APVA

WED - 23 JUL AA
STANDARD OVERNIGHT

CA-US

84

SN



ORIGIN ID:HNLA (808) 261-0740
ESI

354 ULUNIU ST STE 304

KAILUA, HI 967342532
UNITED STATES US

SHIP DATE: 22JUL14
ACTWGT: 54.6 LB
CAD: /POS1501
DIMS: 24x13x13 IN

BILL SENDER

TO **SAMPLE CONTROL**
CAL SCIENCE
7440 LINCOLN WAY

GARDEN GROVE CA 92841

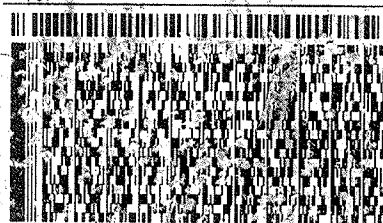
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REF:

INU:

PO:

DEPT:



FedEx
Express



2 of 2

MPS# 7800 4710 4871

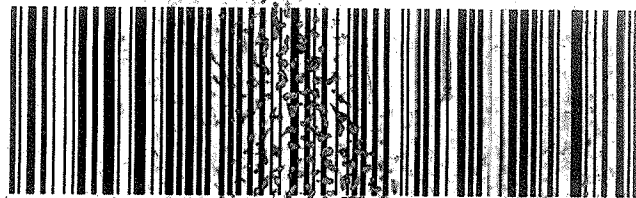
Mstr# 8045 5791 7397

0200

WED - 23 JUL AA
STANDARD OVERNIGHT

WZ APVA

92841
CA-US SNA



Calscience

WORK ORDER #: 14-07-1550

SAMPLE RECEIPT FORM

Cooler 1 of 2

CLIENT: Env Science

DATE: 07/23/14

TEMPERATURE: Thermometer ID: SC1 (Criteria: 0.0 °C – 6.0 °C, not frozen except sediment/tissue)

Temperature 2.6 °C - 0.3 °C (CF) = 2.3 °C ☒ Blank ☐ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by:)

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.

☐ Received at ambient temperature, placed on ice for transport by Courier.

Ambient Temperature: ☐ Air ☐ Filter

Checked by: 15

CUSTODY SEALS INTACT:

☒ Cooler ☐ ☐ No (Not Intact) ☐ Not Present ☐ N/A Checked by: 15

☒ Sample ☐ ☐ No (Not Intact) ☐ Not Present Checked by: 826

SAMPLE CONDITION:

	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COC document(s) received complete.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
<input type="checkbox"/> No analysis requested. <input type="checkbox"/> Not relinquished. <input type="checkbox"/> No date/time relinquished.			
Sampler's name indicated on COC.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample container label(s) consistent with COC.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample container(s) intact and good condition.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proper containers and sufficient volume for analyses requested.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Analyses received within holding time.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Aqueous samples received within 15-minute holding time			
<input type="checkbox"/> pH <input type="checkbox"/> Residual Chlorine <input type="checkbox"/> Dissolved Sulfides <input type="checkbox"/> Dissolved Oxygen.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Proper preservation noted on COC or sample container.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tedlar bag(s) free of condensation.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

CONTAINER TYPE:

Solid: ☐ 4ozCGJ ☐ 8ozCGJ ☐ 16ozCGJ ☐ Sleeve () ☐ EnCores® ☐ TerraCores® ☐

Aqueous: ☒ VOA ☒ VOAH ☐ VOAna₂ ☐ 125AGB ☐ 125AGBh ☐ 125AGBp ☒ 1AGB ☐ 1AGBna₂ ☐ 1AGBs

☐ 500AGB ☒ 500AGJ ☐ 500AGJs ☐ 250AGB ☐ 250CGB ☐ 250CGBs ☐ 1PB ☐ 1PBna ☐ 500PB

☐ 250PB ☒ 250PBna ☐ 125PB ☐ 125PBznn ☐ 100PJ ☐ 100PJna ☐ ☐ ☐

Air: ☐ Tedlar® ☐ Canister Other: ☐ Trip Blank Lot#: 131007B Labeled/Checked by: 826

Container: C: Clear A: Amber P: Plastic G: Glass J: Jar B: Bottle Z: Ziploc/Resealable Bag E: Envelope Reviewed by: 776

Preservative: h: HCL n: HNO₃ na₂: Na₂S₂O₃ na: NaOH p: H₃PO₄ s: H₂SO₄ u: Ultra-pure znn: ZnAc₂+NaOH f: Filtered Scanned by: 776

Calscience

WORK ORDER #: 14-07-1550

SAMPLE RECEIPT FORM

Cooler 2 of 2

CLIENT: Env. Science

DATE: 07/23/14

TEMPERATURE: Thermometer ID: SC1 (Criteria: 0.0 °C – 6.0 °C, not frozen except sediment/tissue)

Temperature 2.8 °C - 0.3 °C (CF) = 2.5 °C ☒ Blank ☐ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by:)

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.

☐ Received at ambient temperature, placed on ice for transport by Courier.

Ambient Temperature: ☐ Air ☐ Filter

Checked by: 15

CUSTODY SEALS INTACT:

☒ Cooler ☐ No (Not Intact) ☐ Not Present ☐ N/A Checked by: 15

☒ Sample ☐ No (Not Intact) ☐ Not Present Checked by: 8/16

SAMPLE CONDITION:

	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COC document(s) received complete.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
<input type="checkbox"/> No analysis requested. <input type="checkbox"/> Not relinquished. <input type="checkbox"/> No date/time relinquished.			
Sampler's name indicated on COC.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample container label(s) consistent with COC.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample container(s) intact and good condition.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proper containers and sufficient volume for analyses requested.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Analyses received within holding time.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Aqueous samples received within 15-minute holding time			
<input type="checkbox"/> pH <input type="checkbox"/> Residual Chlorine <input type="checkbox"/> Dissolved Sulfides <input type="checkbox"/> Dissolved Oxygen.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Proper preservation noted on COC or sample container.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tedlar bag(s) free of condensation.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

CONTAINER TYPE:

Solid: ☐ 4ozCGJ ☐ 8ozCGJ ☐ 16ozCGJ ☐ Sleeve () ☐ EnCores® ☐ TerraCores® ☐

Aqueous: ☒ VOA ☐ VOAh ☐ VOAna₂ ☐ 125AGB ☐ 125AGBh ☐ 125AGBp ☒ 1AGB ☐ 1AGBna₂ ☐ 1AGBs

☐ 500AGB ☒ 500AGJ ☐ 500AGJs ☐ 250AGB ☐ 250CGB ☐ 250CGBs ☐ 1PB ☐ 1PBna ☐ 500PB

☐ 250PB ☒ 250PBna ☐ 125PB ☐ 125PBznn ☐ 100PJ ☐ 100PJna₂ ☐ ☐ ☐

Air: ☐ Tedlar® ☐ Canister Other: ☐ Trip Blank Lot#: Labeled/Checked by: 8/16

Container: C: Clear A: Amber P: Plastic G: Glass J: Jar B: Bottle Z: Ziploc/Resealable Bag E: Envelope Reviewed by: 778

Preservative: h: HCL n: HNO₃ na₂: Na₂S₂O₃ na: NaOH p: H₃PO₄ s: H₂SO₄ u: Ultra-pure znn: ZnAc₂+NaOH f: Filtered Scanned by: 778

RAW DATA SHEET FOR METHOD: EPA 8015B (M)

WORK ORDER: 14-07-1550
INSTRUMENT: GC 45
EXTRACTION: EPA 3510C
D/T EXTRACTED: 2014-07-24 00:00

ANALYZED BY: 628
D/T ANALYZED: 2014-07-25 09:09
REVIEWED BY:
D/T REVIEWED:

DATA FILE: W:\GC 45\GC 45 DATA\2014\140724\14072455.D\14072455

1 **CLIENT SAMPLE NUMBER:** ES106

LCS/MB BATCH: 140724B11B **SAMPLE VOLUME / WEIGHT:** DEFAULT: 500.00 ml / ACTUAL: 500.00 ml
MS/MSD BATCH: **FINAL VOLUME / WEIGHT:** DEFAULT: 5.00 ml / ACTUAL: 2.50 ml
UNITS: ug/L **ADJUSTMENT RATIO TO PF:** 0.50

COMMENT: Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag. TPH as Diesel is quantified in the carbon range C10-C28.

<u>COMPOUND</u>	<u>INI. CONC</u>	<u>DF</u>	<u>CONC</u>	<u>DL</u>	<u>LOD</u>	<u>LOQ</u>	<u>QUAL</u>
TPH as Diesel	7390	1.00	37.0	11	12	25	b

Area Percent Report

Data File Name : W:\GC_45\GC 45 DATA\2014\140724\14072455.D
 Page Number : 1
 Operator : 682 Vial Number : Vial 55
 Instrument : GC 45 Injection Number : 1
 Sample Name : 14-07-1550-1 Sequence Line : 55
 Instrument Method: C:\CHEM32\1\METHODS\ ->
 Acquired on : 25 Jul 14 9:09:52 AM
 Report Created on: 25 Jul 14 06:12 pm Analysis Method : 8015B.MTH

Software Revision: Rev. B.04.03-SP1 [87] Copyright © Agilent Technologies

Sig. 1 in W:\GC_45\GC 45 DATA\2014\140724\ ->

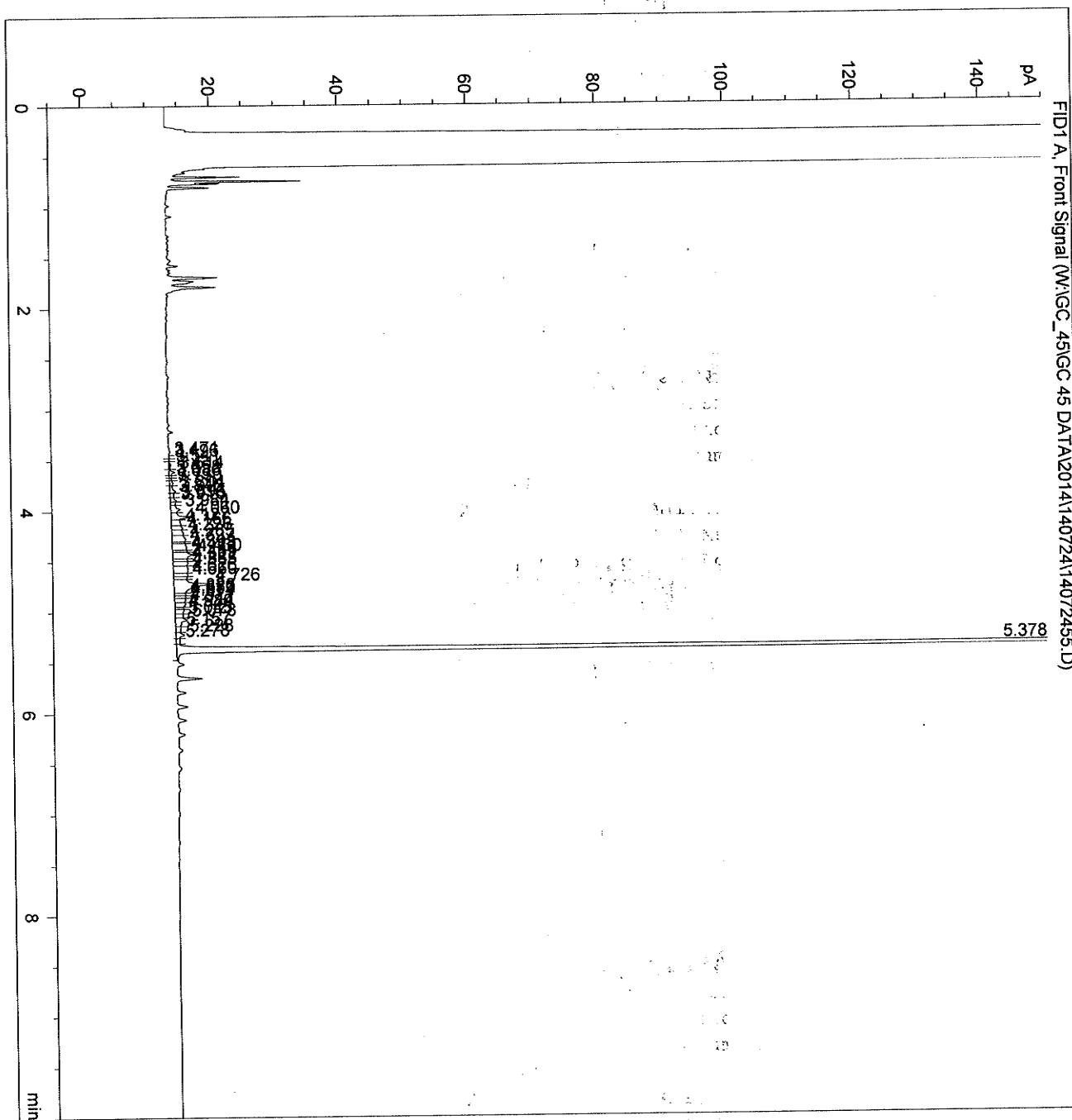
Pk	Ret Time	Area	Height	Peak	Width	Response %
1	3.471	0.27		0 VV	0.025	0.029
2	3.496	0.27		0 VV	0.024	0.029
3	3.541	0.98		0 VV	0.046	0.107
4	3.614	1.57		1 VV	0.030	0.171
5	3.658	0.52		0 VV	0.024	0.056
6	3.686	0.50		0 VV	0.023	0.055
7	3.730	1.30		1 VV	0.040	0.141
8	3.804	2.38		1 VV	0.043	0.259
9	3.840	1.42		1 VV	0.041	0.155
10	3.896	1.97		1 VV	0.034	0.214
11	3.916	1.57		1 VV	0.031	0.170
12	3.984	4.47		1 VV	0.050	0.486
13	4.060	6.75		3 VV	0.037	0.734
14	4.127	4.63		1 VV	0.053	0.504
15	4.166	4.30		2 VV	0.042	0.468
16	4.226	5.53		2 VV	0.051	0.602
17	4.285	7.70		2 VV	0.061	0.837
18	4.327	1.85		2 VV	0.015	0.201
19	4.393	8.42		2 VV	0.062	0.916
20	4.413	2.78		2 VV	0.020	0.303
21	4.430	10.16		3 VV	0.054	1.105
22	4.489	3.55		2 VV	0.026	0.386
23	4.511	5.51		2 VV	0.040	0.599
24	4.565	9.84		2 VV	0.072	1.070
25	4.626	4.25		2 VV	0.032	0.462
26	4.660	3.64		2 VV	0.028	0.396
27	4.726	23.63		6 VV	0.068	2.570
28	4.826	2.64		2 VV	0.024	0.287
29	4.850	2.76		2 VV	0.025	0.301
30	4.874	4.16		2 VV	0.039	0.452
31	4.921	4.46		2 VV	0.044	0.485
32	4.980	1.55		1 VV	0.019	0.168
33	4.984	3.42		1 VV	0.041	0.372
34	5.045	2.97		1 VV	0.038	0.323
35	5.078	5.93		2 VV	0.054	0.645
36	5.157	2.76		1 VV	0.054	0.300
37	5.228	3.08		1 VV	0.038	0.335
38	5.278	1.92		1 VV	0.048	0.209
39	5.378	763.94		549 VV	0.023	83.096

Total area = 919.34

Area Percent Report

Data File Name : W:\GC_45\GC 45 DATA\2014\140724\14072455.D
 Page Number : 2
 Operator : 682 Vial Number : Vial 55
 Instrument : GC 45 Injection Number : 1
 Sample Name : 14-07-1550-1 Sequence Line : 55
 Instrument Method: C:\CHEM32\1\METHODS\ ->
 Acquired on : 25 Jul 14 9:09:52 AM
 Report Created on: 25 Jul 14 06:12 pm Analysis Method : 8015B.MTH

Software Revision: Rev. B.04.03-SP1 [87] Copyright © Agilent Technologies



RAW DATA SHEET FOR METHOD: EPA 8015B (M)

WORK ORDER: 14-07-1550
INSTRUMENT: GC 45
EXTRACTION: EPA 3510C
D/T EXTRACTED: 2014-07-24 00:00

ANALYZED BY: 628
D/T ANALYZED: 2014-07-25 09:28
REVIEWED BY:
D/T REVIEWED:

DATA FILE: W:\GC 45\GC 45 DATA\2014\140724\14072456.D\14072456

2 **CLIENT SAMPLE NUMBER:** ES107

LCS/MB BATCH: 140724B11B **SAMPLE VOLUME / WEIGHT:** DEFAULT: 500.00 ml / ACTUAL: 500.00 ml
MS/MSD BATCH: **FINAL VOLUME / WEIGHT:** DEFAULT: 5.00 ml / ACTUAL: 2.50 ml
UNITS: ug/L **ADJUSTMENT RATIO TO PF:** 0.50

COMMENT: Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag. TPH as Diesel is quantified in the carbon range C10-C28.

<u>COMPOUND</u>	<u>INI. CONC</u>	<u>DF</u>	<u>CONC</u>	<u>DL</u>	<u>LOD</u>	<u>LOQ</u>	<u>QUAL</u>
TPH as Diesel	107	1.00	ND	11	12	25	

Area Percent Report

Data File Name : W:\GC_45\GC 45 DATA\2014\140724\14072456.D
 Page Number : 1
 Operator : 682 Vial Number : Vial 56
 Instrument : GC 45 Injection Number : 1
 Sample Name : 14-07-1550-2 Sequence Line : 56
 Instrument Method: C:\CHEM32\1\METHODS\ ->
 Acquired on : 25 Jul 14 9:28:40 AM
 Report Created on: 25 Jul 14 06:12 pm Analysis Method : 8015B.MTH

Software Revision: Rev. B.04.03-SP1 [87] Copyright © Agilent Technologies

Sig. 1 in W:\GC_45\GC 45 DATA\2014\140724\ ->

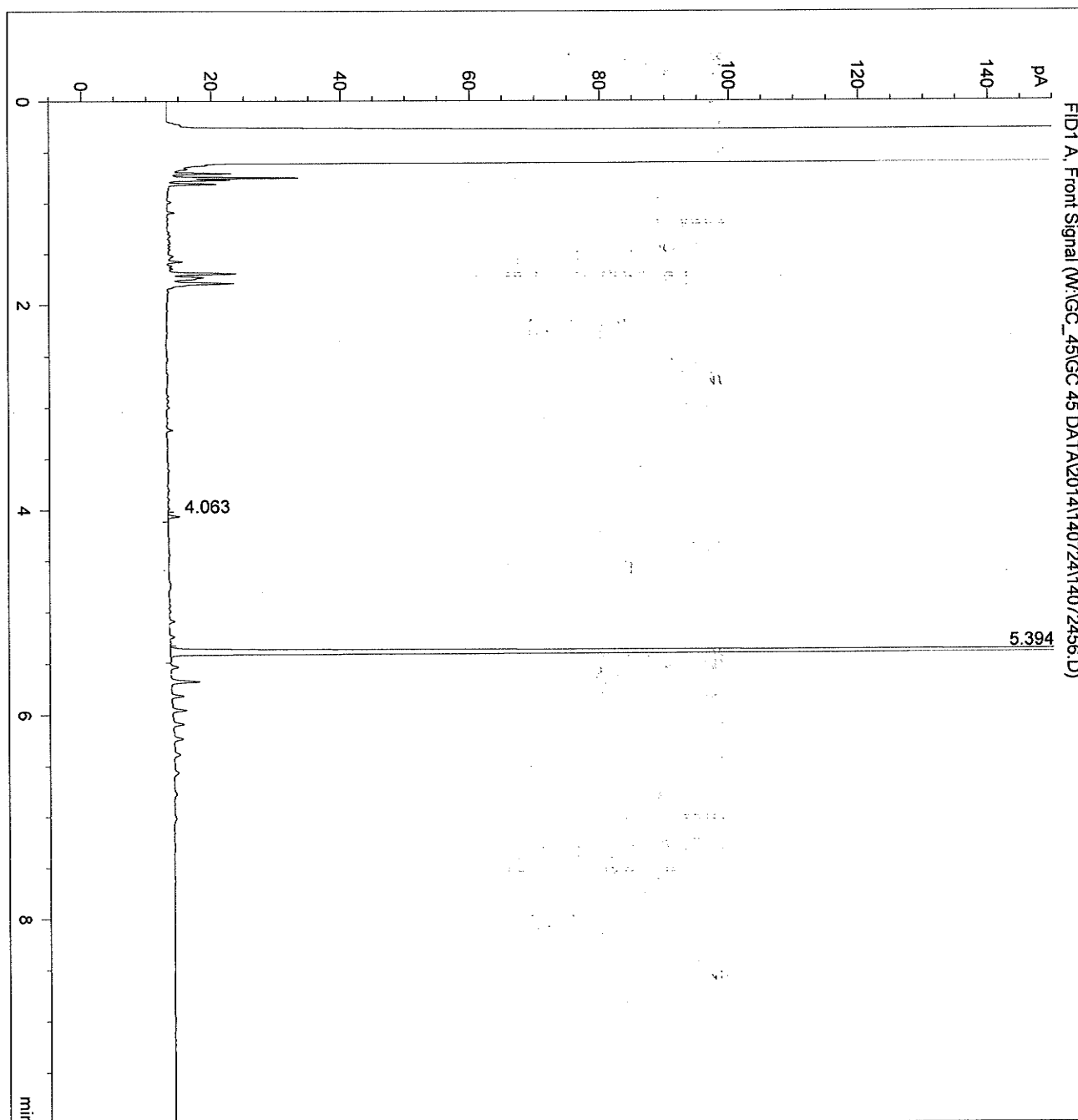
Pk	Ret Time	Area	Height	Peak	Width	Response %
1	4.063	2.25		2 VV	0.019	0.290
2	5.394	771.63		549 VB	0.021	99.710

Total area = 773.87

Area Percent Report

Data File Name : W:\GC_45\GC 45 DATA\2014\140724\14072456.D
Page Number : 2
Operator : 682 Vial Number : Vial 56
Instrument : GC 45 Injection Number : 1
Sample Name : 14-07-1550-2 Sequence Line : 56
Instrument Method: C:\CHEM32\1\METHODS\ ->
Acquired on : 25 Jul 14 9:28:40 AM
Report Created on: 25 Jul 14 06:12 pm Analysis Method : 8015B.MTH

Software Revision: Rev. B.04.03-SP1 [87] Copyright © Agilent Technologies



RAW DATA SHEET
FOR METHOD: EPA 8015B (M)

WORK ORDER: 14-07-1550
INSTRUMENT: GC 45
EXTRACTION: EPA 3510C
D/T EXTRACTED: 2014-07-24 00:00

ANALYZED BY: 628
D/T ANALYZED: 2014-07-25 09:47
REVIEWED BY:
D/T REVIEWED:

DATA FILE: W:\GC 45\GC 45 DATA\2014\140724\14072457.D\14072457

3 **CLIENT SAMPLE NUMBER: ES108**

LCS/MB BATCH: 140724B11B **SAMPLE VOLUME / WEIGHT:** DEFAULT: 500.00 ml / ACTUAL: 500.00 ml
MS/MSD BATCH: **FINAL VOLUME / WEIGHT:** DEFAULT: 5.00 ml / ACTUAL: 2.50 ml
UNITS: ug/L **ADJUSTMENT RATIO TO PF:** 0.50

COMMENT: Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag. TPH as Diesel is quantified in the carbon range C10-C28.

<u>COMPOUND</u>	<u>INI. CONC</u>	<u>DF</u>	<u>CONC</u>	<u>DL</u>	<u>LOD</u>	<u>LOQ</u>	<u>QUAL</u>
TPH as Diesel	270	1.00	ND	11	12	25	

Area Percent Report

Data File Name : W:\GC_45\GC 45 DATA\2014\140724\14072457.D
 Page Number : 1
 Operator : 682 Vial Number : Vial 57
 Instrument : GC 45 Injection Number : 1
 Sample Name : 14-07-1550-3 Sequence Line : 57
 Instrument Method: C:\CHEM32\1\METHODS\ ->
 Acquired on : 25 Jul 14 9:47:30 AM
 Report Created on: 25 Jul 14 06:12 pm Analysis Method : 8015B.MTH

Software Revision: Rev. B.04.03-SP1 [87] Copyright © Agilent Technologies

Sig. 1 in W:\GC_45\GC 45 DATA\2014\140724\ ->

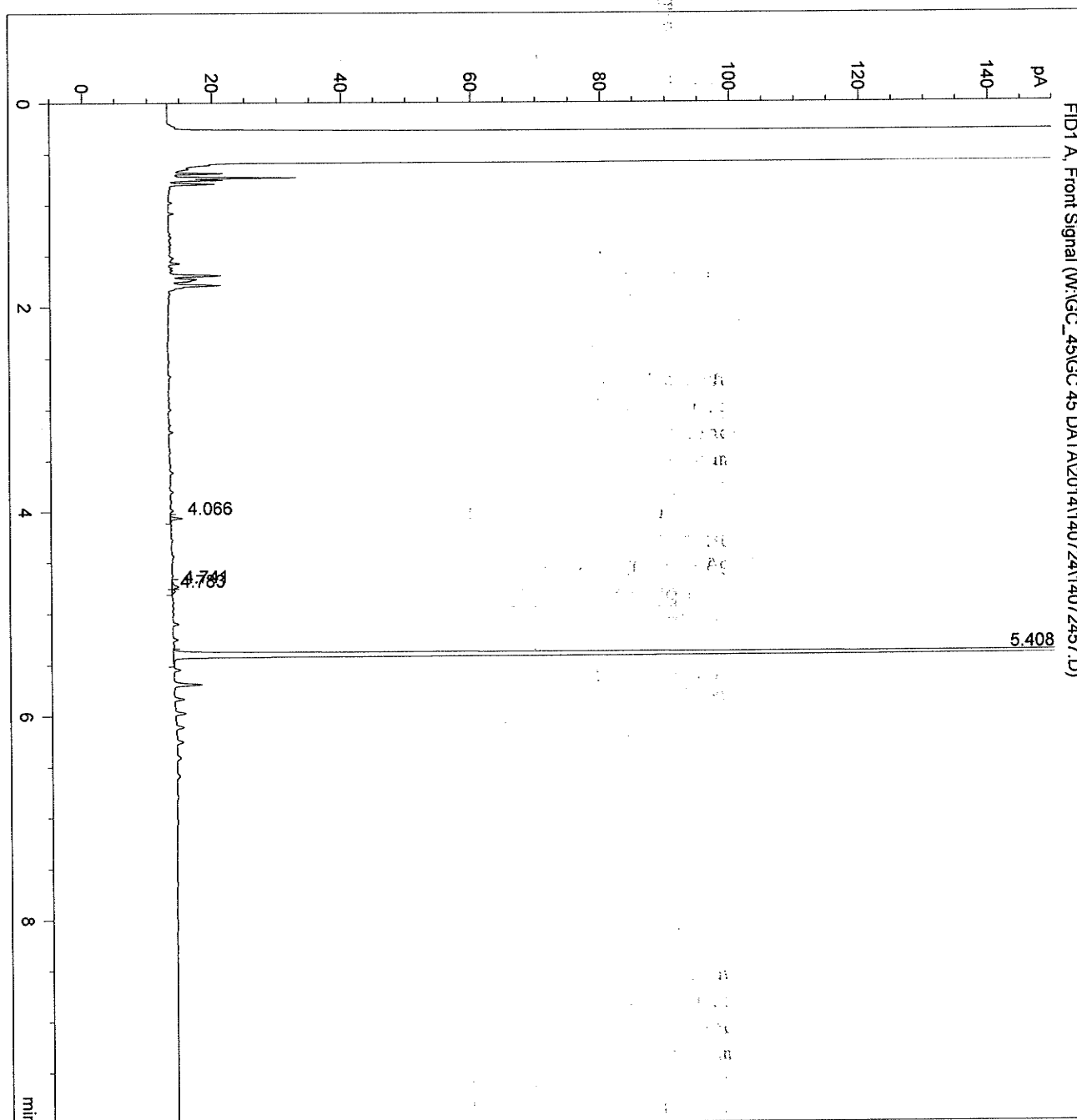
Pk	Ret Time	Area	Height	Peak	Width	Response %
1	4.066	2.43		2 VB	0.020	0.289
2	4.741	2.28		1 VV	0.031	0.271
3	4.783	0.97		1 VV	0.028	0.115
4	5.408	837.46		593 VV	0.022	99.325

Total area = 843.14

Area Percent Report

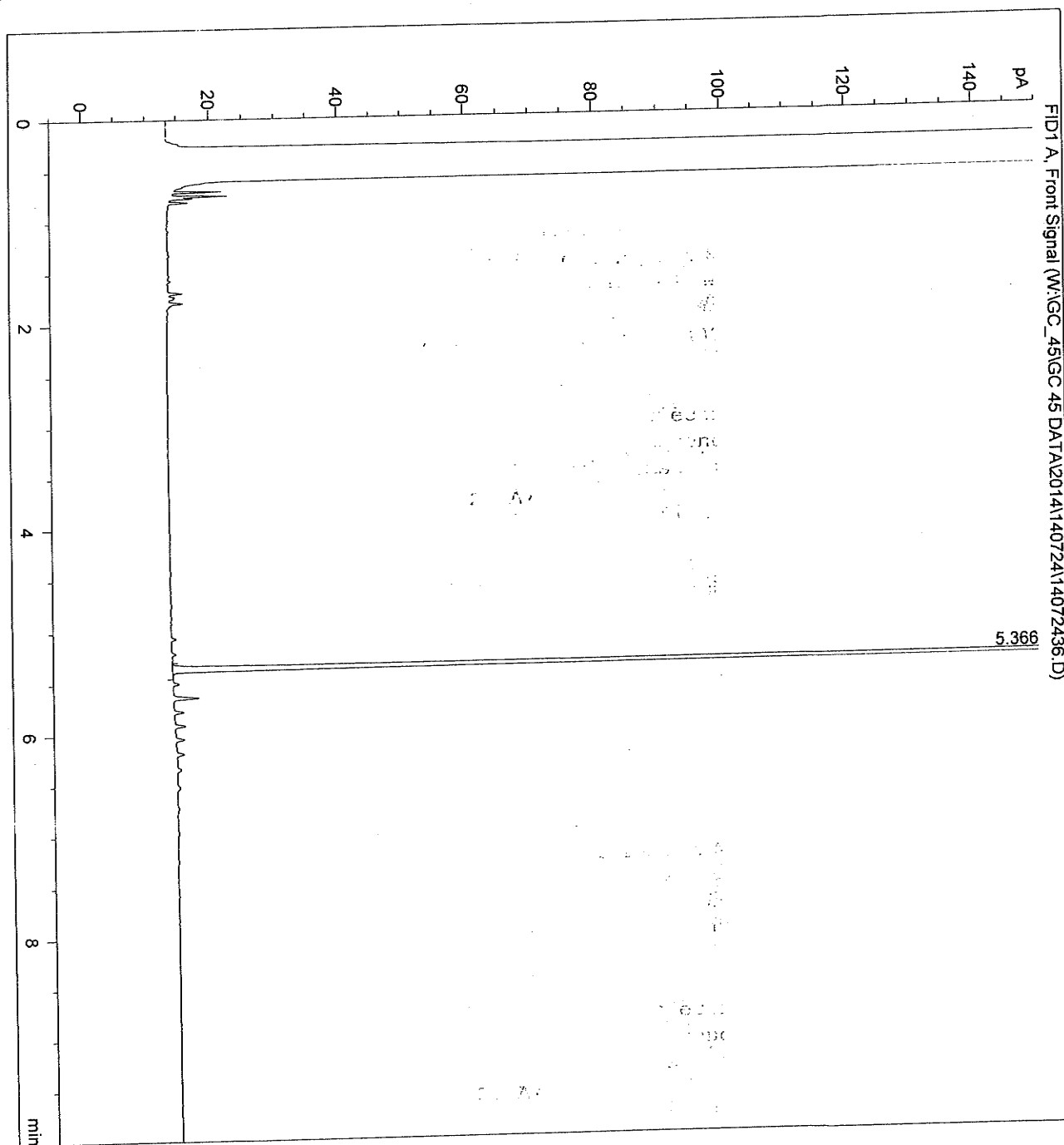
Data File Name : W:\GC_45\GC 45 DATA\2014\140724\14072457.D
 Page Number : 2
 Operator : 682 Vial Number : Vial 57
 Instrument : GC 45 Injection Number : 1
 Sample Name : 14-07-1550-3 Sequence Line : 57
 Instrument Method: C:\CHEM32\1\METHODS\ ->
 Acquired on : 25 Jul 14 9:47:30 AM
 Report Created on: 25 Jul 14 06:12 pm Analysis Method : 8015B.MTH

Software Revision: Rev. B.04.03-SP1 [87] Copyright © Agilent Technologies



Area Percent Report

Data File Name : W:\GC_45\GC 45 DATA\2014\140724\14072436.D
Page Number : 2
Operator : 682
Instrument : GC 45
Sample Name : MB 14072411/12
Vial Number : Vial 36
Injection Number : 1
Sequence Line : 36
Instrument Method: C:\CHEM32\1\METHODS\ ->
Acquired on : 25 Jul 14 3:30:24 AM
Report Created on: 25 Jul 14 06:11 pm
Analysis Method : 8015B.MTH
Software Revision: Rev. B.04.03-SP1 [87] Copyright © Agilent Technologies



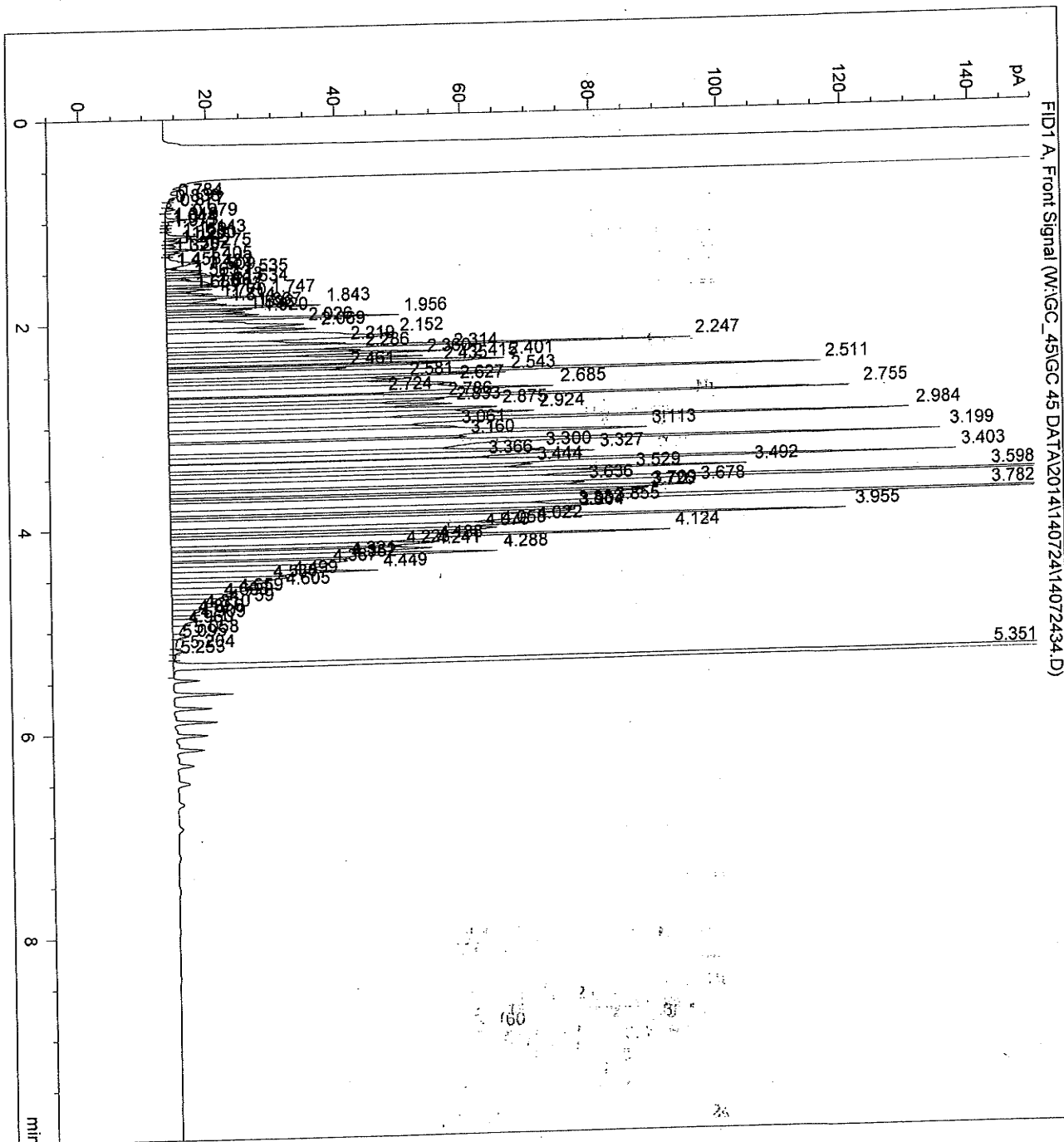
Blank

Area Percent Report

```

Data File Name      : W:\GC_45\GC 45 DATA\2014\140724\14072434.D
Page Number         : 4
Operator            : 682
Instrument           : GC 45
Sample Name         : D400 C28 50 L041814D
Vial Number         : Vial 34
Injection Number    : 1
Sequence Line       : 34
Instrument Method    : C:\CHEM32\1\METHODS\
Acquired on         : 25 Jul 14    2:53:13 AM
Report Created on   : 25 Jul 14    06:11 pm
Analysis Method     : 8015B.MTH
Software Revision   : Rev. B.04.03-SP1 [87] Copyright © Agilent Technologies

```



Diesel Standard

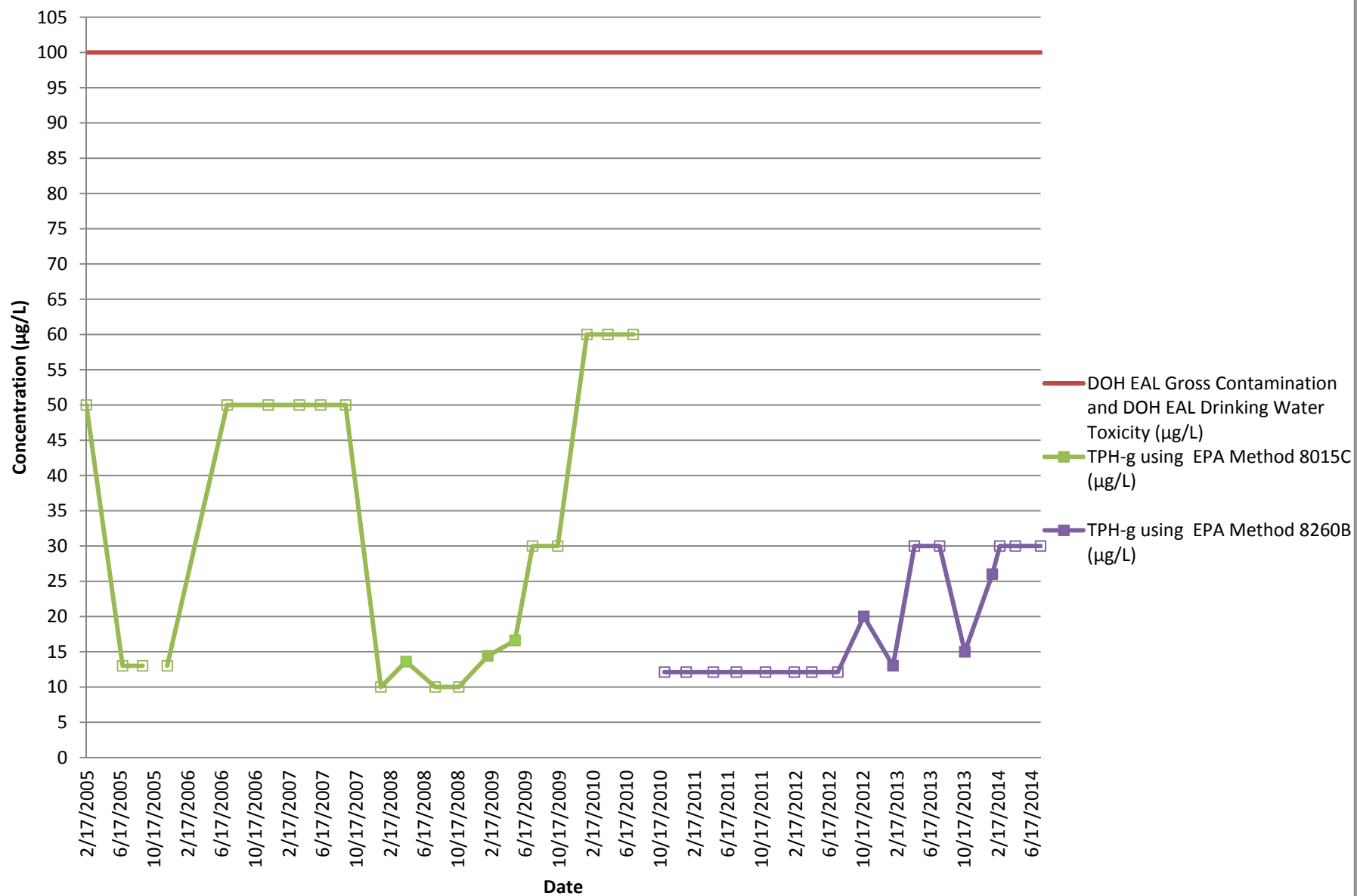
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APPENDIX D

Historical Groundwater Exceedance Trends

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TPH-g Concentrations for RHMW01



Data points for 2/17/2005 through 9/8/2005 and 12/6/2005 are the average of the primary and duplicate samples.

Possible laboratory contamination for 10/22/2012, 10/21/2013, and 1/28/2014 sampling events.

Unfilled boxes indicate non-detections. Method detection limits are shown.

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TPH-d Concentrations for RHMW01



Unfilled boxes indicate non-detections. Method detection limits are shown.

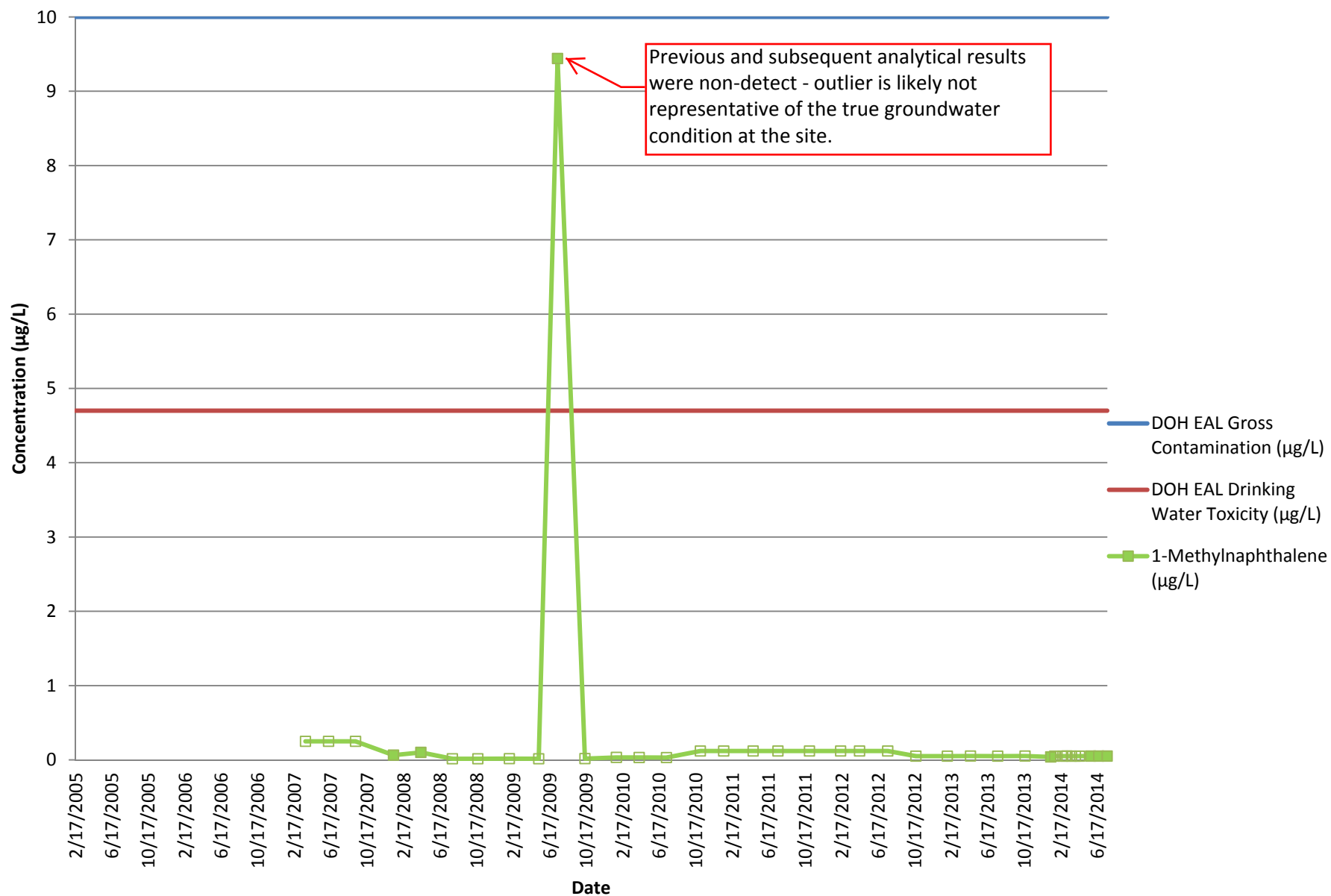
The Site-Specific Risk-Based Level (SSRBL) is 4,500 µg/L.

Numerous sample results had a chromatographic pattern that didn't match the calibration standard. The relatively high TPH-d values may not necessarily be indicative that there is diesel fuel or other petroleum products in the well.

Data points for 2/17/2005 through 9/8/2005 and 12/6/2005 are the average of the primary and duplicate samples.

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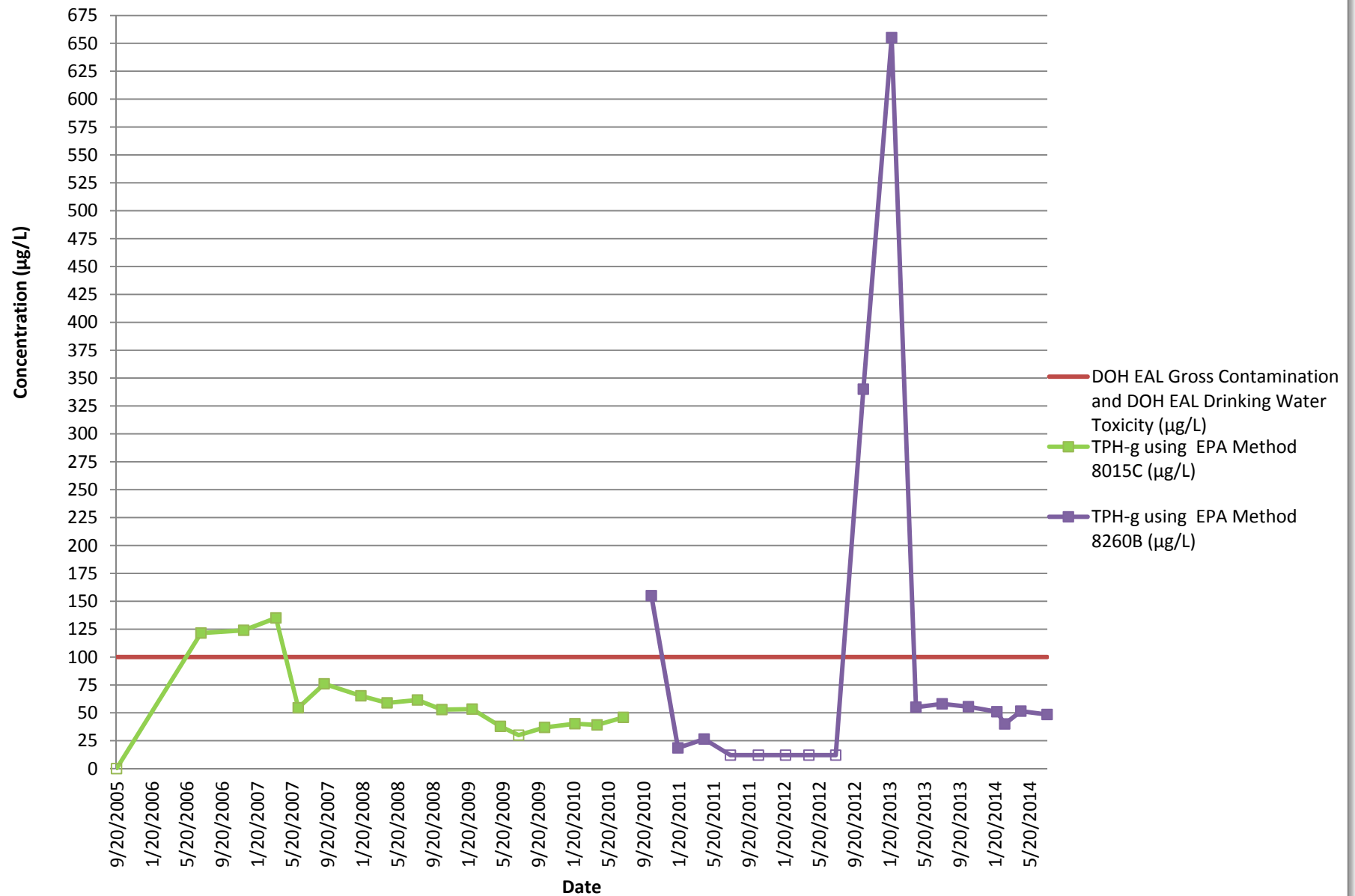
1-Methylnaphthalene Concentrations for RHMW01



Unfilled boxes indicate non-detections. Method detection limits are shown.

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TPH-g Concentrations for RHMW02



Data points for 9/20/2005 through 4/21/2014 are the average of the primary and duplicate samples.

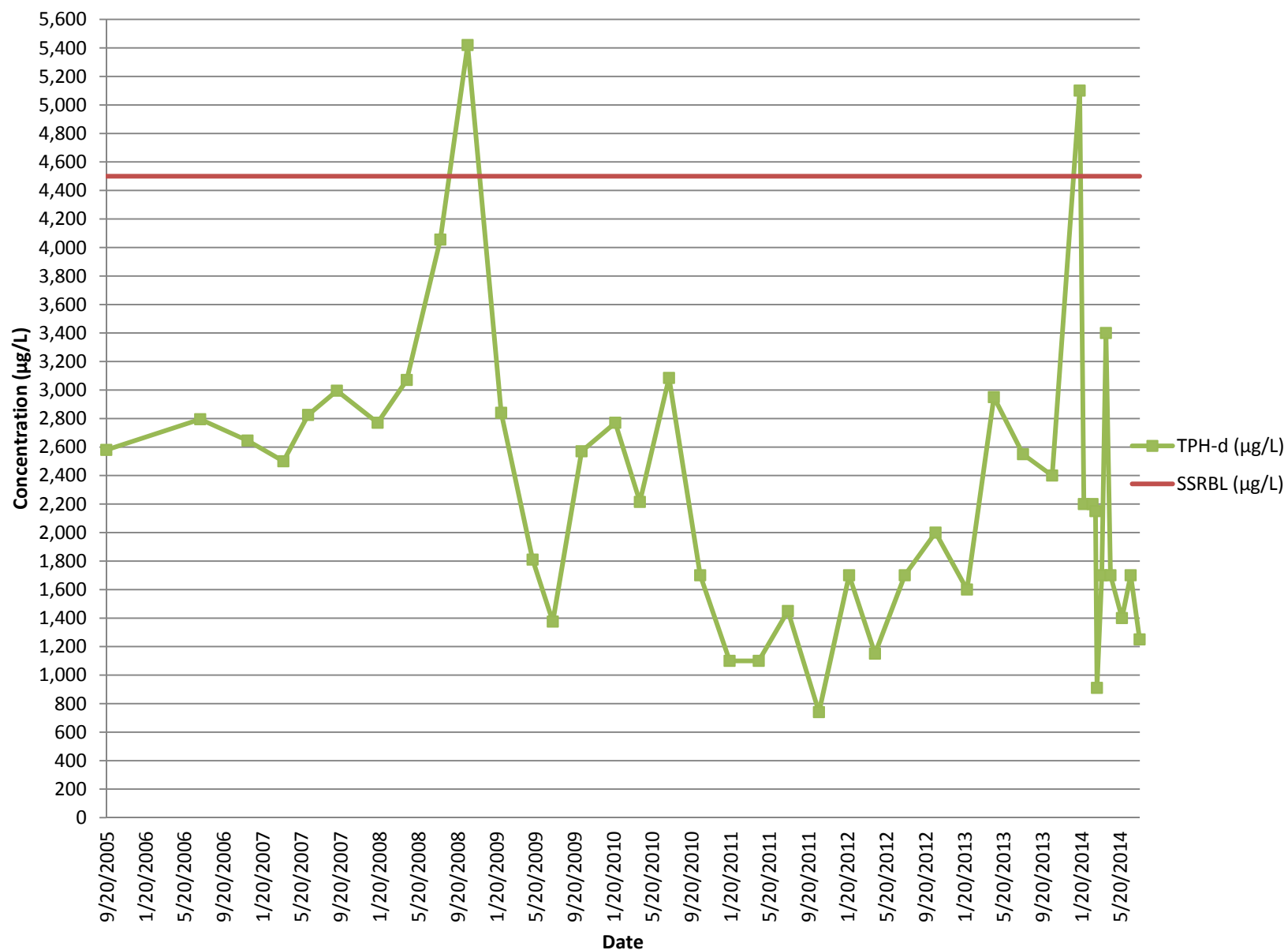
Possible laboratory contamination for 10/21/2013 and 1/28/2014 sampling events.

Unfilled boxes indicate non-detections. Method detection limits are shown.

Primary sample results are shown for 1/26/2012 and 7/18/2012; all other concentrations are the average of the primary and duplicate sample results.

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TPH-d Concentrations for RHMW02



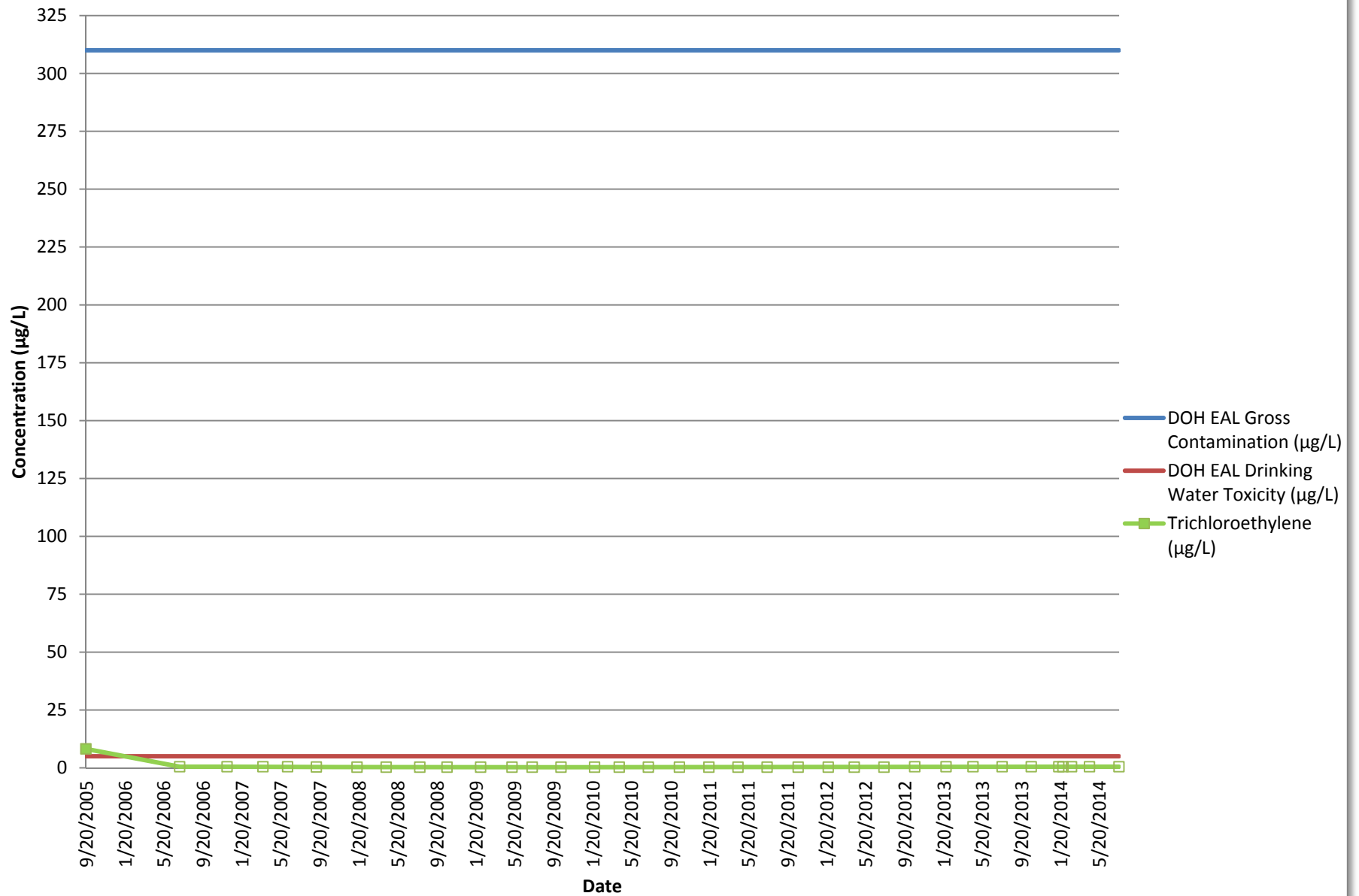
Data points for 9/20/2005 through 4/21/2014 are the average of the primary and duplicate samples.

Unfilled boxes indicate non-detections. Method detection limits are shown.

Numerous sample results had a chromatographic pattern that didn't match the calibration standard. The relatively high TPH-d values may not necessarily be indicative that there is diesel fuel or other petroleum products in the well.

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Trichloroethylene Concentrations for RHMW02

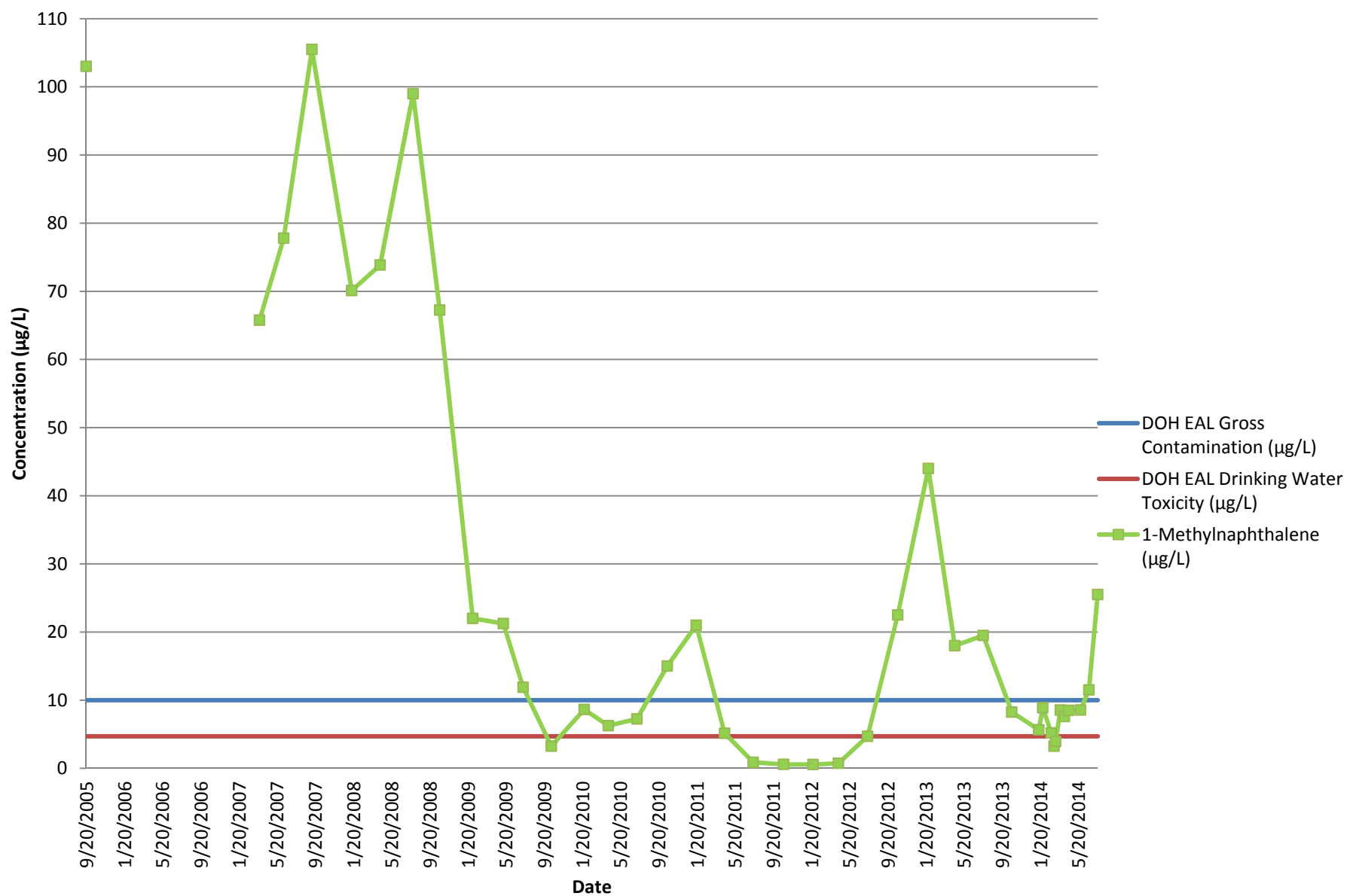


Data points for 9/20/2005 through 4/21/2014 are the average of the primary and duplicate samples.

Unfilled boxes indicate non-detections. Method detection limits are shown.

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1-Methylnaphthalene Concentrations for RHMW02

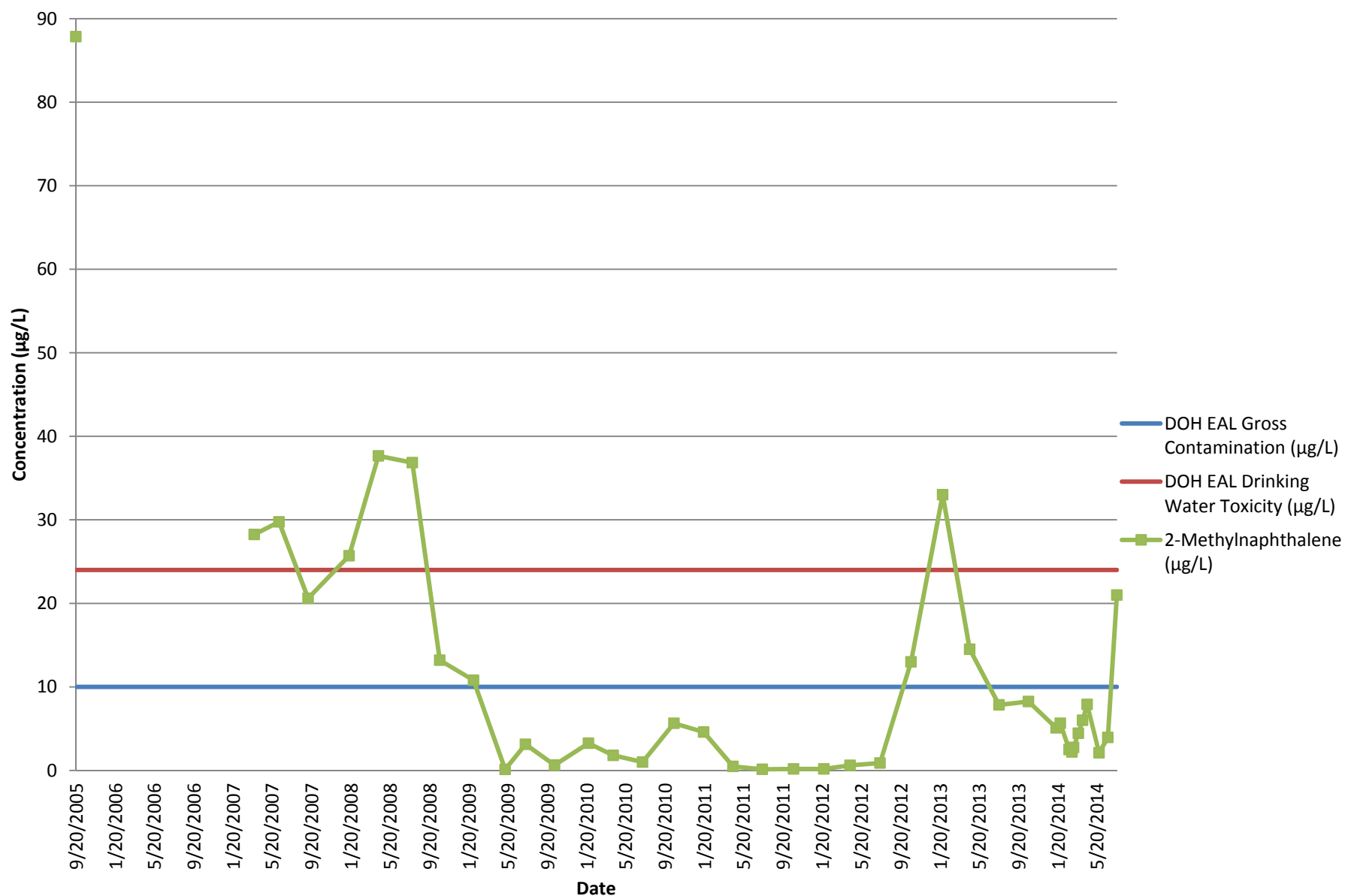


Data points for 9/20/2005 and 3/27/2007 through 4/21/2014 are the average of the primary and duplicate samples.

Unfilled boxes indicate non-detections. Method detection limits are shown.

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2-Methylnaphthalene Concentrations for RHMW02

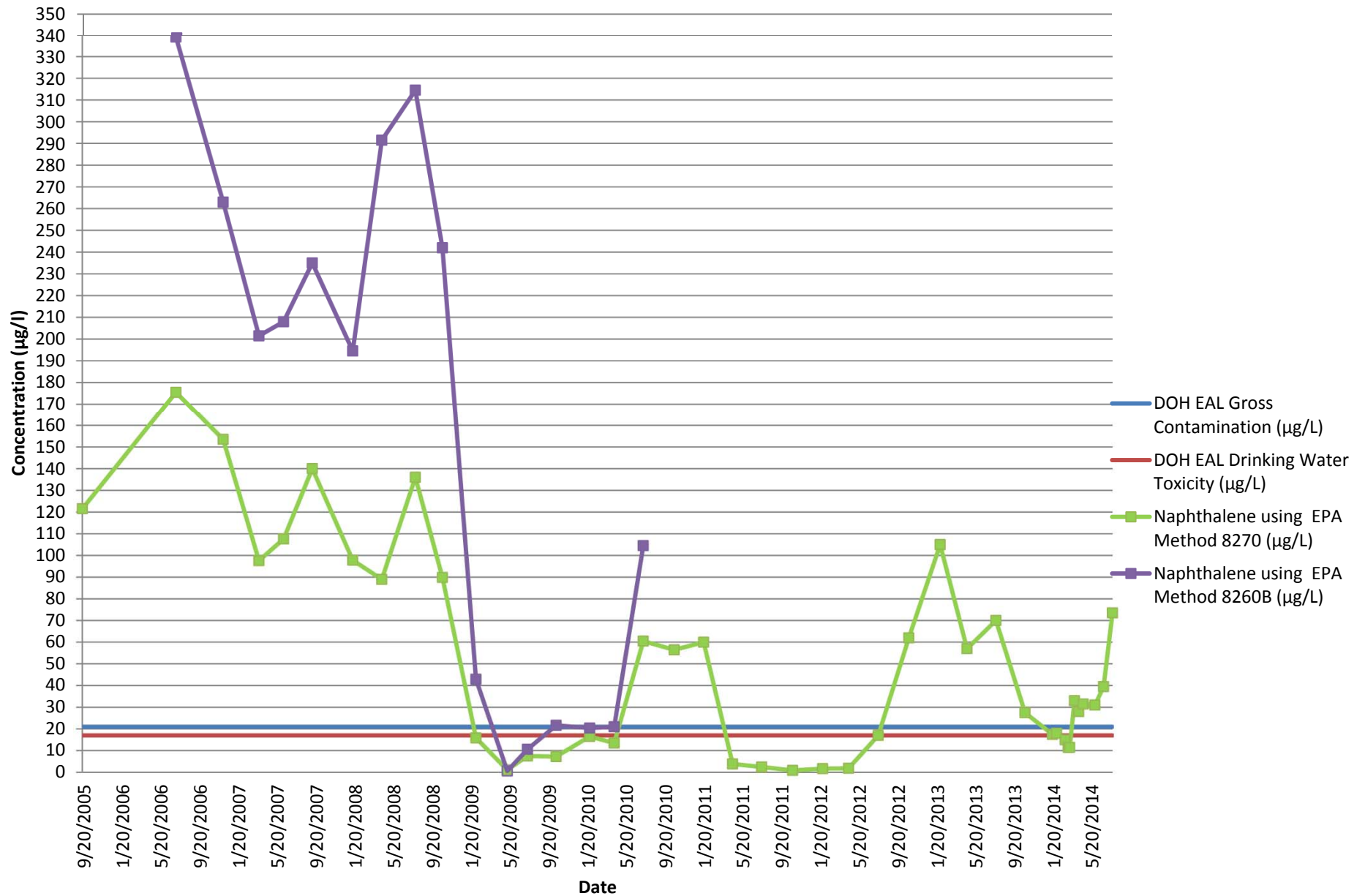


Data points for 9/20/2005 and 3/27/2007 through 4/21/2014 are the average of the primary and duplicate samples.

Unfilled boxes indicate non-detections. Method detection limits are shown.

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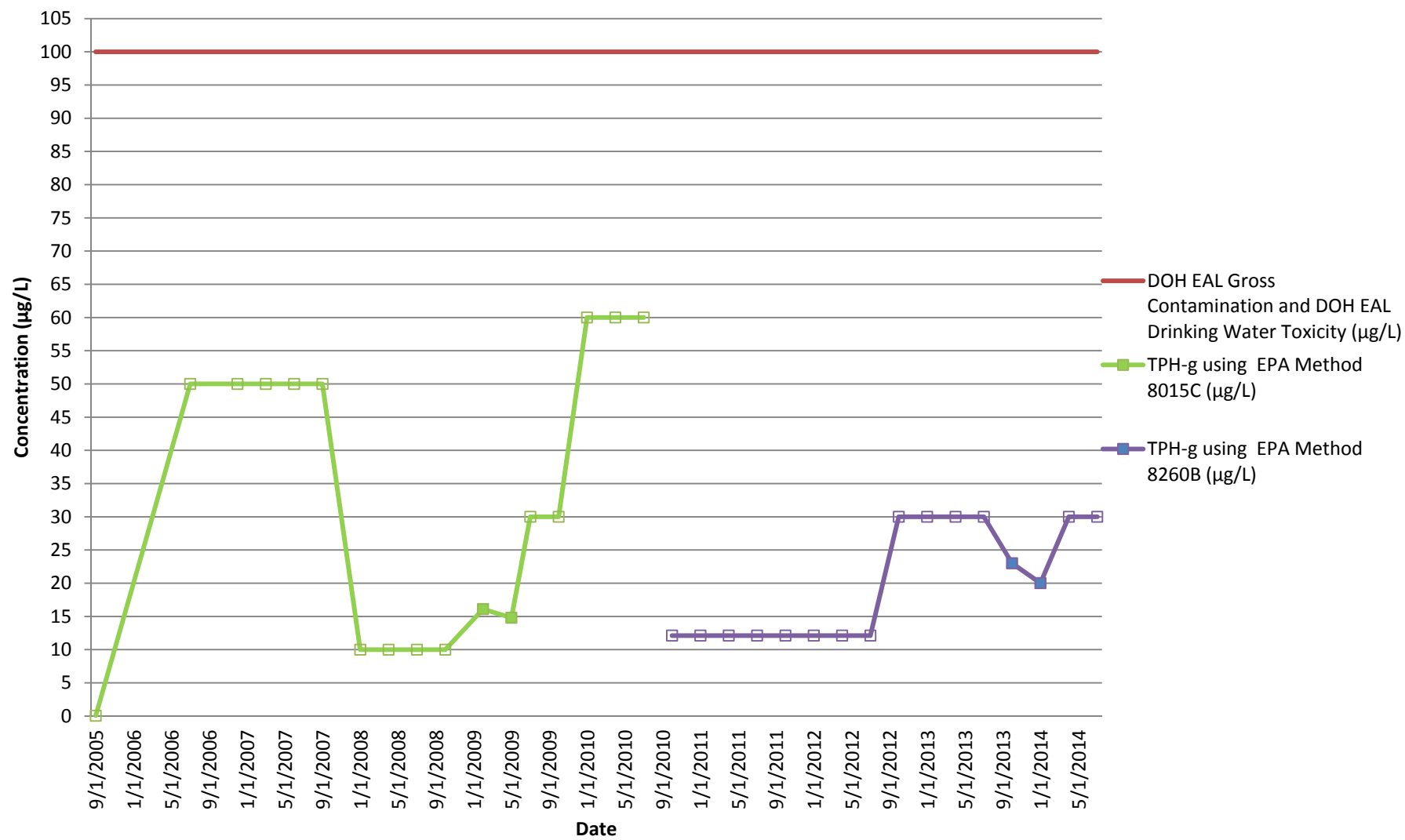
Naphthalene Concentrations for RHMW02



Primary sample results are shown for 1/26/2012 and 4/21/2014; all other concentrations are the average of the primary and duplicate sample results. Unfilled boxes indicate non-detections. Method detection limits are shown.

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TPH-g Concentrations for RHMW03



Possible laboratory contamination for 10/21/2013 and 1/28/2014 sampling events.
Unfilled boxes indicate non-detections. Method detection limits are shown.

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TPH-d Concentrations for RHMW03



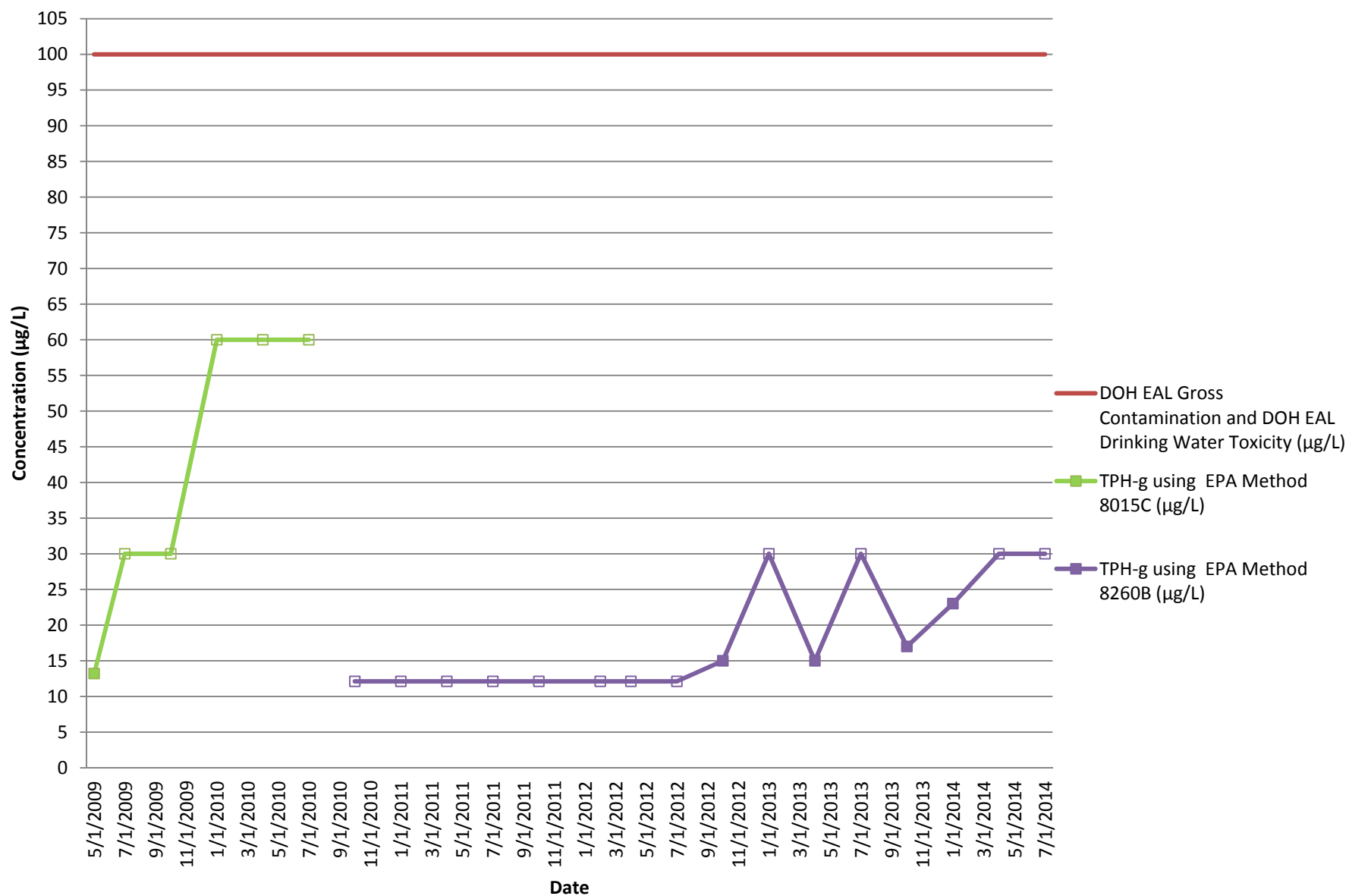
The Site-Specific Risk-Based Level (SSRBL) is 4,500 µg/L.

Unfilled boxes indicate non-detections. Method detection limits are shown.

Numerous sample results had a chromatographic pattern that didn't match the calibration standard. The relatively high TPH-d values may not necessarily be indicative that there is diesel fuel or other petroleum products in the well.

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TPH-g Concentrations for RHMW05



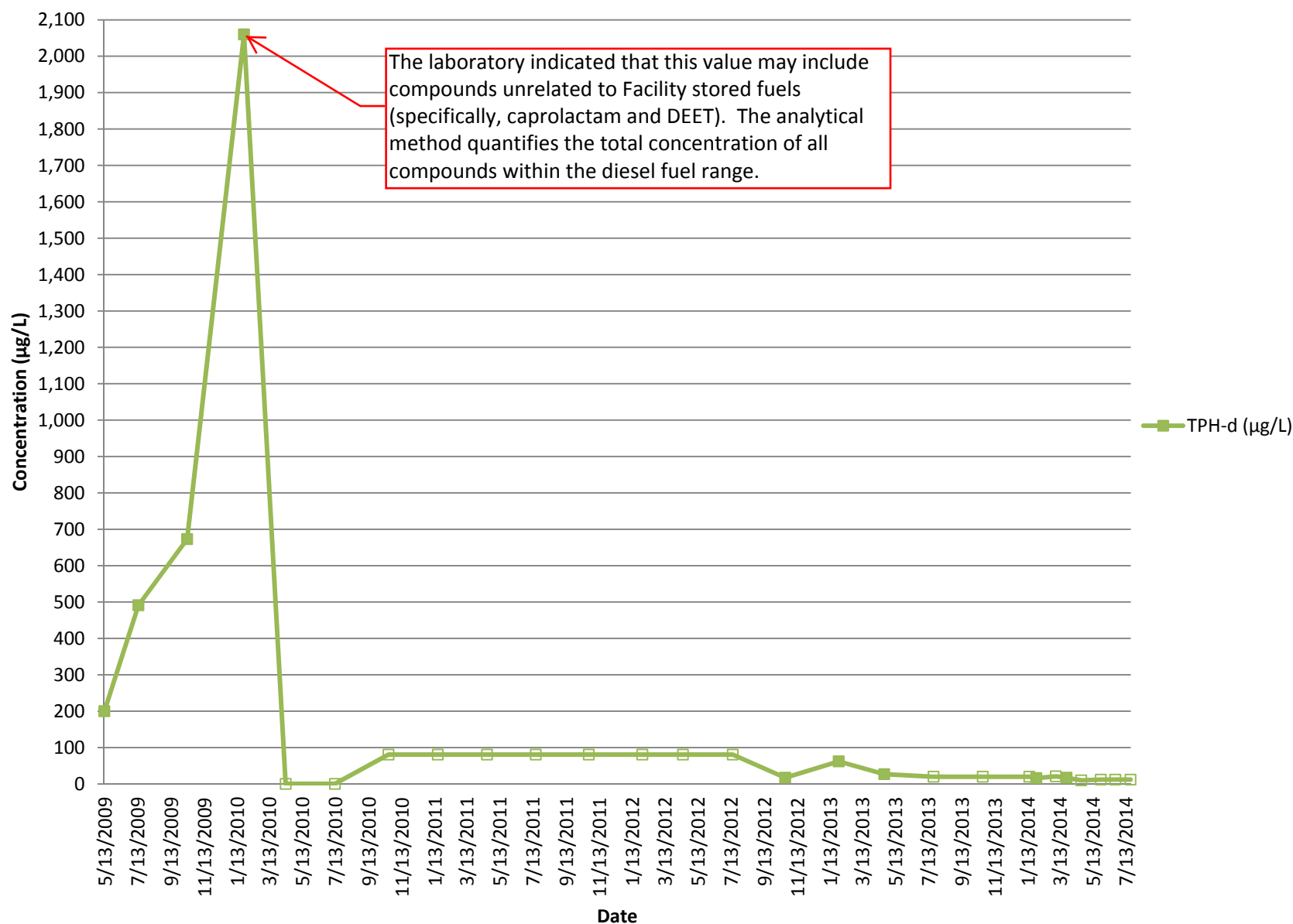
Data point for 7/17/2012 is the average of the primary and duplicate samples.

Unfilled boxes indicate non-detections. Method detection limits are shown.

Possible laboratory contamination for 10/22/2012, 10/22/2013, and 1/29/2014 sampling events.

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TPH-d Concentrations for RHMW05



The Site-Specific Risk-Based Level (SSRBL) is 4,500 µg/L.

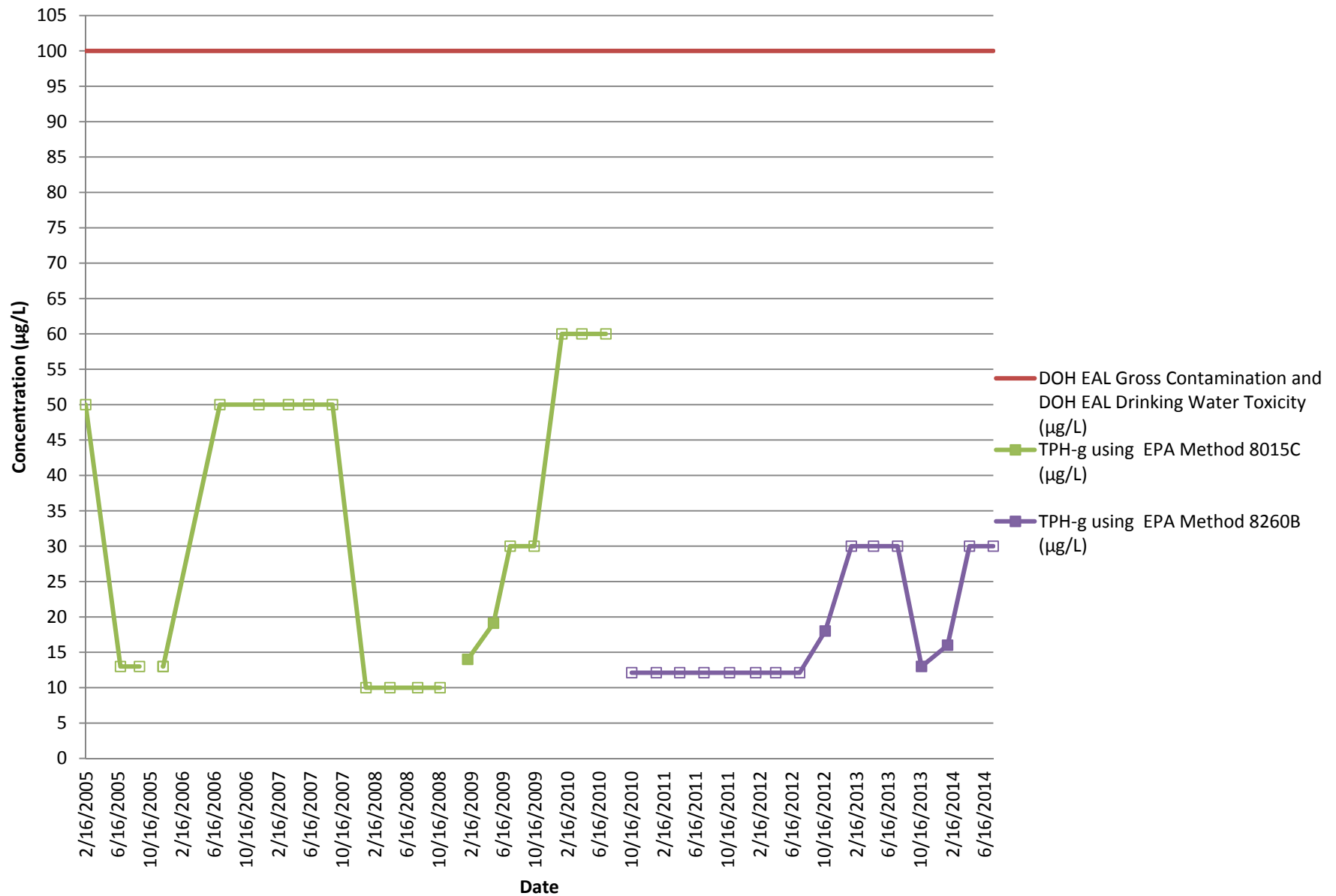
Data point for 7/17/2012 is the average of the primary and duplicate samples.

Unfilled boxes indicate non-detections. Method detection limits are shown.

Numerous sample results had a chromatographic pattern that didn't match the calibration standard. The relatively high TPH-d values may not necessarily be indicative that there is diesel fuel or other petroleum products in the well.

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TPH-g Concentrations for RHMW2254-01

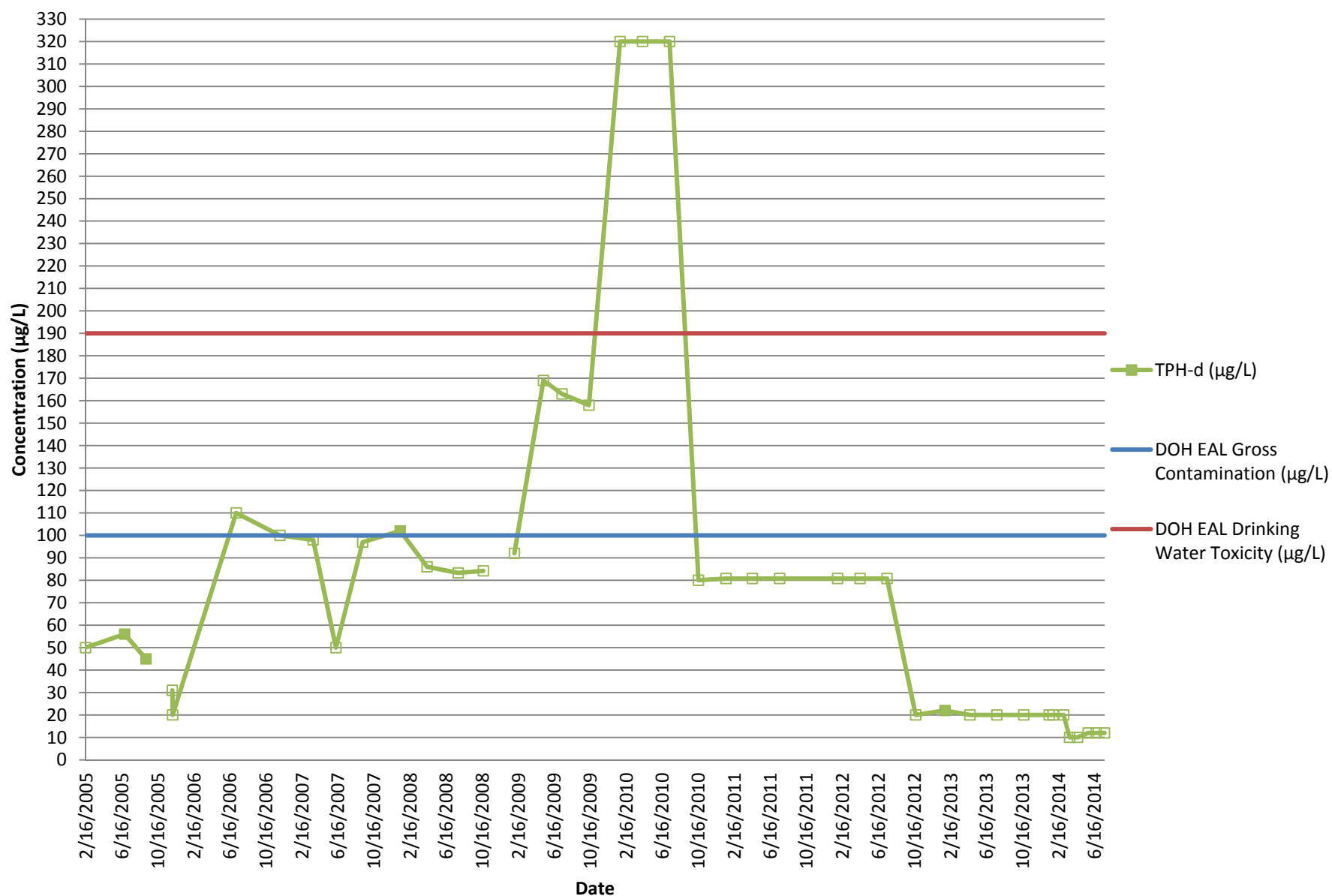


Unfilled boxes indicate non-detections. Method detection limits are shown.

Possible laboratory contamination for 10/22/2012, 10/22/2013, and 1/29/2014 sampling events.

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TPH-d Concentrations for RHMW2254-01



Unfilled boxes indicate non-detections. Method detection limits are shown.

Laboratory data rejected for 1/15/2008 sampling event.

Numerous sample results had a chromatographic pattern that didn't match the calibration standard. The relatively high TPH-d values may not necessarily be indicative that there is diesel fuel or other petroleum products in the well.

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